United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R02-92/189
September 1992
PB93-963815

SDMS Document
102043

EPA

Superfund Record of Decision:

Plattsburgh Air Force Base (Operable Unit 1), NY

NOTICE

The appendices listed in the index that are not found in this document have been removed at the request of the issuing agency. They contain material which supplement, but adds no further applicable information to the content of the document. All supplemental material is, however, contained in the administrative record for this site.

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R02-92/189	2.	3. Recipient's Accession No.

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Plattsburgh Air Force Base (Operable Unit 1), NY
First Remedial Action - Subsequent to follow

5. Report Date 09/30/92

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Orgainization Name and Address

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered 800/000

14.

15. Supplementary Notes
PB93-963815

16. Abstract (Limit: 200 words)

The Plattsburgh Air Force Base (AFB) site is located south of the City of Plattsburgh, Clinton County, New York. Surrounding land use is primarily residential and light industrial. Ground water beneath the site is not used as a drinking water source. Plattsburgh AFB has historically been engaged in numerous operations that have required the use, handling, storage, and disposal of hazardous materials. The U.S. Air Force's Installation Restoration Program (IRP) identified 39 sites at Plattsburgh AFB with potential contamination by hazardous materials. One of these sites, the 10.1-acre LF-023 landfill, is located approximately 300 feet from the Plattsburgh AFB western boundary, and 600 feet northeast of a small mobile home development. From 1966 to 1981, the landfill received domestic wastes for disposal. Daily operations consisted of digging 25-foot-deep trenches, spreading and compacting the trash (typically bagged household garbage), and backfilling with 6-inch layers of sandy soil. Hazardous wastes were not routinely disposed of in this landfill; however, these may have still been deposited. Secondary growth has begun to cover the landfill, allowing a northern section of the site to be utilized as an exercise training/obstacle course. Air Force site investigations have revealed soil, sediment, surface water, and

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Plattsburgh Air Force Base (Operable Unit 1), NY
First Remedial Action - Subsequent to follow
Contaminated Medium: soil, sediment, waste, sw
Key Contaminants: VOCs (benzene, xylenes), other organics (PAHs, PCBs), metals (arsenic)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 76
	20. Security Class (This Page) None	22. Price

(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

Abstract (Continued)

ground water contamination. This ROD addresses a final source control remedy for the contaminated soil, sediment, surface water, and ground water at the site, as OU1. Future RODs are planned to address other OUs at the Base. The primary contaminants of concern affecting the soil, sediment, and surface water are VOCs, including benzene and xylenes; other organics, including PAHs and PCBs; and metals, including arsenic.

The selected remedial action for this site includes clearing and grubbing the site; establishing a low-permeability vegetated cover system over the landfill; diverting the surface water runoff to minimize erosion of the cover and to minimize maintenance requirements; installing a gas detection and monitoring system; developing a post-closure plan to monitor, maintain, and inspect the site; monitoring ground water and surface water; and implementing institutional controls including deed restrictions. The estimated present worth cost for this remedial action is $4,574,000, which includes an estimated present worth O&M cost of $988,000 over 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific soil, sediment, and surface water clean-up goals were not developed for the LF-023 source control action because discrete source areas were not found. Clean-up levels for other contaminated media associated with the site will be established in a subsequent ROD, if necessary.

ROD FACT SHEET

SITE

Name:	Plattsburgh Air Force Base, Landfill LF-023 (O.U.1)
Location/State:	Clinton County, New York
EPA Region:	USEPA Region II
HRS Score (date):	30.34, 11/21/89
NPL Rank:	N/A

ROD

Date Signed:	PAFB, ~~09/24/92~~ 9/30/92
Remedy/ies:	Installation of a low permeability barrier cover system on the landfill
Capital Cost:	$ 3.6 million (present worth)
O & M/Year:	$ 105,000/yr for 30 yrs (present worth)
Present Worth:	$ 4.6 million

LEAD

Remedial/Enforcement:	Federal Facility (Plattsburgh Air Force Base)
Primary Contact (phone):	Philip Von Bargen, Project Manager, PAFB, (518) 565-6679
Secondary Contact (phone):	William Roach, Project Manager, EPA (212) 264-8775

WASTE

Type (metals, PCB, &c):	Volatile organic compounds, semi-volatile organic compounds, PHCs, metals, and pesticides
Medium (soil, g.w., &c):	Groundwater, surface water, and sediment
Origin:	Municipal type landfill
Est. Quantity cu.yd.:	10.1 acre

INSTALLATION RESTORATION PROGRAM
LANDFILL LF-023 SOURCE CONTROL
RECORD OF DECISION

PLATTSBURGH AIR FORCE BASE
PLATTSBURGH, NEW YORK

FINAL

Prepared by:

ABB Environmental Services, Inc.
261 Commercial Street
Portland, Maine 04112
Project No. 6091-70

SEPTEMBER 1992

TABLE OF CONTENTS

Section	Title	Page No.
DECLARATION		vi
1.0	SITE NAME, LOCATION, AND DESCRIPTION	1-1
2.0	SITE HISTORY	2-1
2.1	LAND USE AND RESPONSE HISTORY	2-1
2.2	FEDERAL FACILITIES AGREEMENT HISTORY	2-2
3.0	COMMUNITY PARTICIPATION	3-1
4.0	SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION	4-1
5.0	SUMMARY OF SITE CHARACTERISTICS	5-1
5.1	WASTE/SOIL	5-1
5.2	GROUNDWATER	5-2
5.3	SURFACE WATER/SEDIMENT	5-2
6.0	SUMMARY OF SITE RISKS	6-1
6.1	HUMAN HEALTH RISK ASSESSMENT	6-1
6.2	ENVIRONMENTAL RISK ASSESSMENT	6-5
7.0	DEVELOPMENT AND SCREENING OF ALTERNATIVES	7-1
7.1	STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES	7-1
7.2	TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING	7-2
8.0	DESCRIPTION OF ALTERNATIVES	8-1
8.1	ALTERNATIVE 1: NO ACTION	8-1

TABLE OF CONTENTS
(continued)

Section	Title	Page No.
8.2	ALTERNATIVE 2: SITE GRADING AND VEGETATION ESTABLISHMENT FOR CLOSURE	8-2
8.3	ALTERNATIVE 3: INSTALLATION OF A LOW-PERMEABILITY BARRIER COVER SYSTEM	8-3
9.0	SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES	9-1
9.1	THRESHOLD CRITERIA	9-1
9.2	PRIMARY BALANCING CRITERIA	9-1
9.3	MODIFYING CRITERIA	9-2
9.4	CRITERIA SUMMARY	9-2
9.4.1	Overall Protection of Human Health and the Environment	9-3
9.4.2	Compliance with Applicable or Relevant and Appropriate Requirements	9-3
9.4.3	Long-term Effectiveness and Permanence	9-3
9.4.4	Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment	9-3
9.4.5	Short-term Effectiveness	9-4
9.4.6	Implementability	9-4
9.4.7	Cost	9-4
9.4.8	State Acceptance	9-4
9.4.9	Community Acceptance	9-4
10.0	THE SELECTED REMEDY	10-1
10.1	CLEANUP LEVELS	10-1
10.2	DESCRIPTION OF REMEDIAL COMPONENTS	10-2
11.0	STATUTORY DETERMINATIONS	11-1
11.1	THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT	11-1

TABLE OF CONTENTS
(continued)

Section	Title	Page No.
11.2	THE SELECTED REMEDY ATTAINS ARARS	11-1
11.3	THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE	11-4
11.4	THE SELECTED REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE	11-5
11.5	THE SELECTED REMEDY DOES NOT SATISFY THE PREFERENCE FOR TREATMENT THAT PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY, OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT	11-6
12.0	DOCUMENTATION OF NO SIGNIFICANT CHANGES	12-1
13.0	REGULATORY ROLE	13-1

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

REFERENCES

APPENDICES

APPENDIX A	-	ADMINISTRATIVE RECORD INDEX
APPENDIX B	-	STATE CONCURRENCE LETTER
APPENDIX C	-	PUBLIC HEARING TRANSCRIPT
APPENDIX D	-	RESPONSIVENESS SUMMARY

LIST OF FIGURES

Figure	Title	Page No.
1	Vicinity Location Map	1-3
2	LF-023 Location Map	1-4
3	LF-023 Site Features	2-3
4	LF-023 Potential Migration Pathways and Receptors	5-5

LIST OF TABLES

Table	Title	Page No.
1	LF-023 Site Contaminants By Media	5-3
2	Summary of LF-023 Site Risk Estimates - Security Police	6-7
3	Summary of LF-023 Site Risk Estimates - Child Trespasser	6-8
4	Summary of LF-023 Site Risk Estimates - Future Residents	6-9
5	Summary of Alternatives Screening	7-3

DECLARATION

SITE NAME AND LOCATION

Plattsburgh Air Force Base (AFB), Landfill LF-023 (O.U.1)
Plattsburgh, New York

STATEMENT OF BASIS AND PURPOSE

This decision document presents a selected source control remedial action that will provide containment of wastes at Landfill LF-023 on Plattsburgh AFB in Plattsburgh, New York. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. Through this document, Plattsburgh AFB plans to remedy the potential exposure risk to human health and welfare and the environment posed by surface soil at LF-023. This decision is based on the Administrative Record for the site, which was developed in accordance with Section 113(k) of CERCLA and which is available for review at Plattsburgh AFB in Plattsburgh, New York. The attached index identifies the items comprising the Administrative Record upon which the selection of the remedial action is based (see Appendix A).

The New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (USEPA) concur with the selected remedy. The state's statement of concurrence with this selected remedy is presented in Appendix B.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from LF-023, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to human health and welfare and the environment.

DESCRIPTION OF THE SELECTED REMEDY

The action described in this decision document addresses the principal threat at LF-023 by preventing endangerment to human health and welfare and the environment through institutional controls and containment of the landfill to minimize (1) exposure to surface soil contaminants and (2) leaching of contaminants present in surface soils and waste.

The selected source control remedy includes establishing institutional controls, constructing a low-permeability barrier cover system over the landfill to isolate contaminated soils and minimize infiltration of water into the landfill. The remedy also includes the development of a post-closure plan specifying inspection, maintenance, and monitoring programs to be conducted over a 30-year period. In addition, institutional controls for this site will be incorporated into the Plattsburgh AFB Comprehensive Plan. This will ensure that future owners will be made aware of the landfill location and are informed that the integrity of the final covers, liners, or any other component of the containment or monitoring system must not be compromised.

This ROD addresses the groundwater only in reference to source control. A separate Feasibility Study (FS), Proposed Plan, and ROD will be prepared to address potential risks associated with groundwater, surface water, and sediment.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the source control remedial action, and is cost-effective. This remedy was evaluated along with others that utilize permanent solutions and alternative treatment technologies or resource recovery technologies. However, because treatment of the principal threats at the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. Treatment technologies were identified during the development and initial screening of alternatives, but were determined to be infeasible for LF-023 because (1) there are no on-site hot spots that represent major sources of contamination and (2) the estimated large volume of waste at the site preclude a remedy in which contaminants could be excavated and treated effectively.

Because this remedy will result in hazardous substances remaining on site, a review will be conducted by Plattsburgh AFB, USEPA, and NYSDEC within five years after closure to ensure that the source control remedy continues to provide adequate

protection of human health and the environment. This review will be conducted at least every five years as long as hazardous substances remain on site at levels that may pose a risk to human health and the environment.

9/30/92

CONSTANTINE SIDAMON-ERISTOFF Date
Regional Administrator, USEPA Region II

28 Sep 92

JAMES E. ANDREWS Date
Colonel, USAF
Commander, 380 ARW

1.0 SITE NAME, LOCATION, AND DESCRIPTION

Plattsburgh Air Force Base (AFB) is located in Clinton County in northeastern New York State, bordered on the north by the City of Plattsburgh, on the south and west by the Town of Plattsburgh, and on the east by Lake Champlain (Figure 1). The base is approximately 26 miles south of the Canadian border and 167 miles north of Albany. Landfill LF-023 is located west of the runway approximately 300 feet from the Plattsburgh AFB boundary (Figure 2).

Access to the landfill from the east and south is restricted because the site is bordered by a controlled access area. Access from the north and west is somewhat less restricted, but is limited by an intact 4-foot-high, three-wire fence posted with "No Trespassing" signs. This area is patrolled regularly by Plattsburgh AFB security personnel. Vehicles can access the landfill via a dirt road leading from the Perimeter Road within the controlled access flightline area through a gate near the Fire Training Area (FT-002).

An obstacle course in the northeast portion of LF-023 is used regularly by U.S. Air Force personnel during the warmer months. Other military and civilian personnel are not likely to come in contact with the landfill.

LF-023 is approximately 600 feet northeast of a small mobile home development on Old NY Route 22, near the interchange with Interstate 87. A dirt road formerly led from the mobile home park road to the northeast and onto the base, just south of LF-023. This road intersects with Perimeter Road on base. Vehicle access via this road from off base is prevented by an earthen barrier and gate. The area between LF-023 and the mobile home park is mostly wooded. The nearest on-base housing is more than 6,000 feet east of the site. The light industrial area along Route 22 is approximately 600 feet north of the site.

Site topography slopes gradually toward the east and south with a surface gradient of approximately 0.026. There are no surface water features within the LF-023 site; however, shallow groundwater discharges to the ground surface downgradient of the landfill in seeps and drainages approximately 600 feet south of the site.

The plant community at LF-023 consists of a pitch pine plantation surrounding an open area with sparse weedy vegetation. The wetland south of the site is primarily a red maple-hardwood swamp, and is regulated by the New York State Department

of Environmental Conservation (NYSDEC). Several species of birds, mammals, reptiles, and amphibians may inhabit the site; however, no state or federally listed or proposed endangered or threatened species are known to exist within 2 miles of Plattsburgh AFB.

Site geology consists of approximately 80 feet of sand, 5 feet of silt, 10 feet of clay, and 25 feet of till overlying carbonate bedrock. Soil within the landfill is poorly graded fine-to-medium sand with trace silt, and appears to be native soil mined in the area. Two aquifers at the site include an unconfined aquifer in the sand unit (below the depth of waste), located approximately 30 feet below ground surface (bgs), and a confined aquifer in the bedrock. Groundwater in the unconfined aquifer flows south and southeast toward Lake Champlain and a topographic low south of the site. Groundwater in the confined aquifer flows east toward Lake Champlain.

A more complete description of LF-023 can be found in the LF-022/LF-023 Remedial Investigation (RI) Report on pages 1-5 through 1-8 and 4-1 through 4-13 (ABB-ES, 1992a).

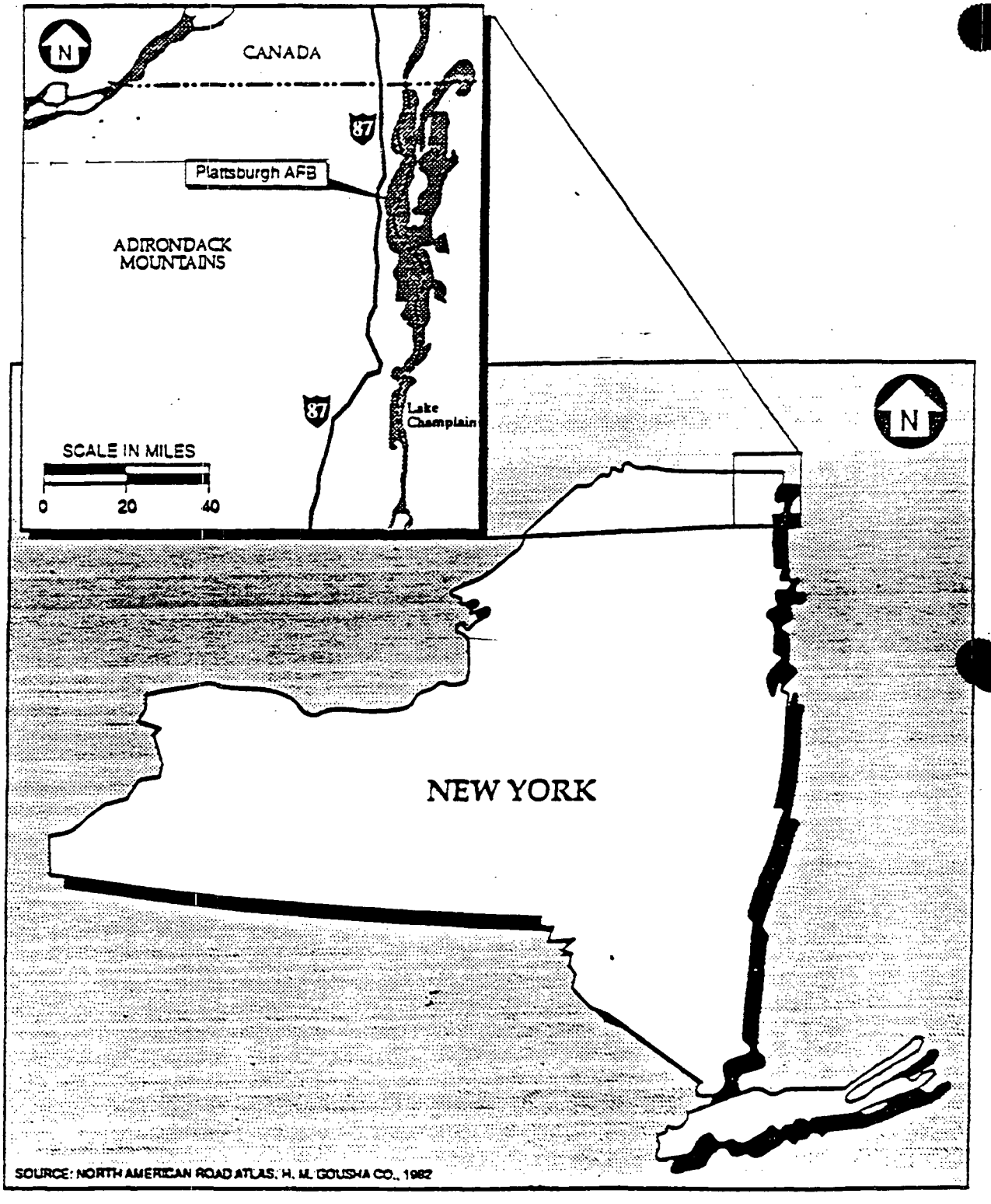
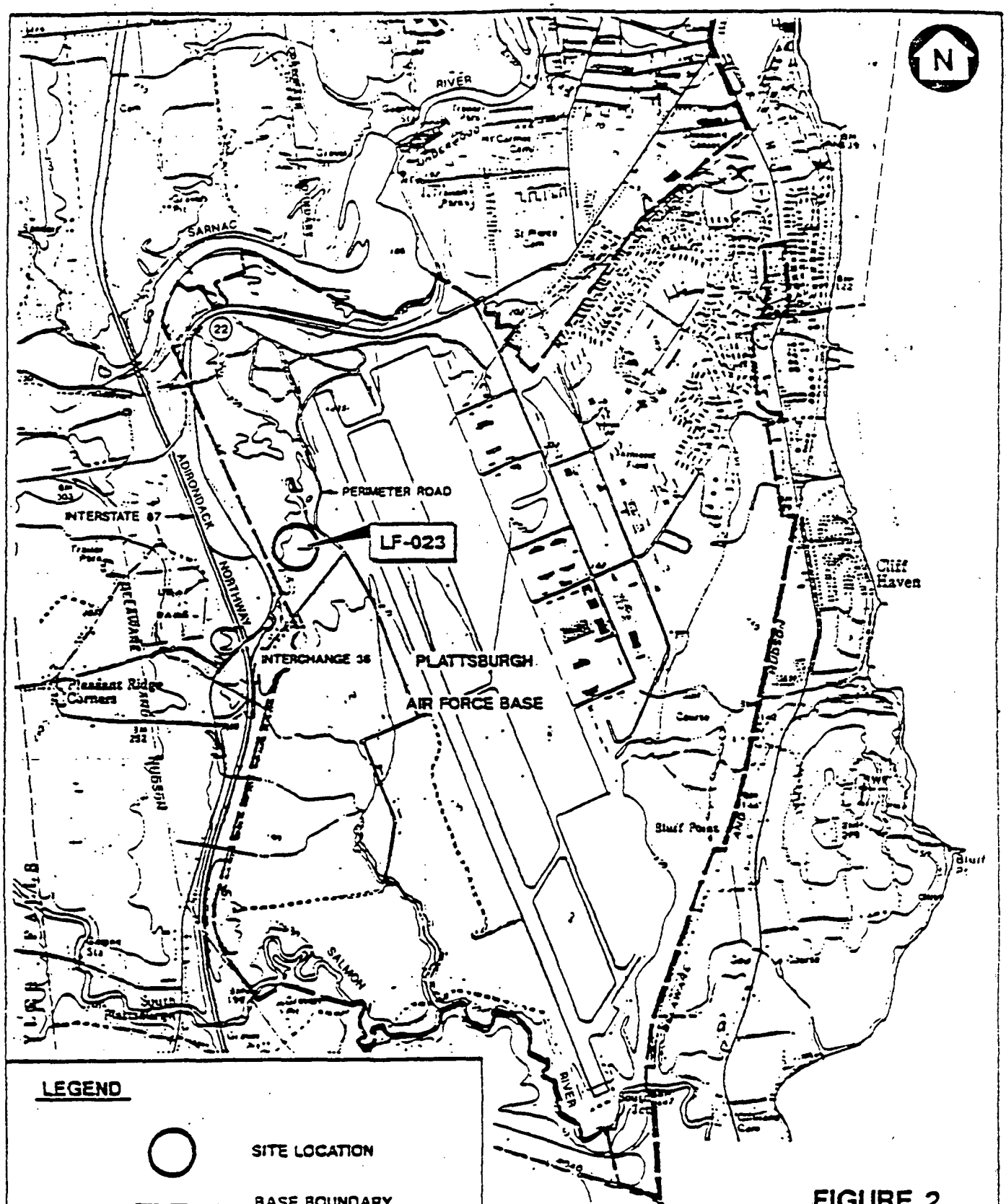


FIGURE 1
VICINITY LOCATION MAP

PLATTSBURGH AFB

ABB Environmental Services, Inc.

9206010D



SOURCE: USGS QUADRANGLE PLATTSBURGH, N.Y.
7.5 MINUTE SERIES.
SCALE IN FEET

0 2000 4000

FIGURE 2
LF-023 LOCATION MAP
LF-023 SOURCE CONTROL
RECORD OF DECISION
PLATTSBURGH AFB

ABB Environmental Services, Inc.

6091-71

POOR QUALITY ORIGINAL

2.0 SITE HISTORY

In accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Plattsburgh AFB is publishing this Record of Decision (ROD) to address public review and comment on the selected containment alternative, known as a remedial alternative, for LF-023. Plattsburgh AFB, in consultation with NYSDEC and the U.S. Environmental Protection Agency (USEPA), considered public comments as part of the final decision-making process for selecting the LF-023 source control remedy. This ROD summarizes the results conclusions of and the RI, Feasibility Study (FS), and Proposed Plan.

2.1 LAND USE AND RESPONSE HISTORY

LF-023, the last active landfill at Plattsburgh AFB, is approximately 500 feet wide and 800 feet long and reportedly received domestic wastes for disposal from 1966 to 1981 (Figure 3). Daily operations consisted of digging 25-foot-deep trenches, spreading and compacting the trash (typically bagged household garbage), and backfilling with 6-inch layers of sandy soil. Hazardous wastes were not routinely disposed of in this landfill; however, hazardous materials might have been deposited. The maximum volume of fill is estimated at 406,000 cubic yards. Since landfilling operations ceased, secondary growth has begun to cover the site and an exercise training course has been constructed in the northern section of the site.

Several site investigations have been conducted at LF-023 as part of the Installation Restoration Program (IRP) at Plattsburgh AFB. A Preliminary Assessment verified that the site was potentially contaminated. The Preliminary Assessment prompted a Site Inspection (SI), which confirmed the presence of contamination. SI activities included soil, waste, and groundwater sampling. An RI was conducted to characterize the nature and extent of contamination at LF-023 and included groundwater, surface soil, sediment, and surface water sampling. A more detailed description of the site history can be found in the RI Report on pages 1-10 through 1-11 (ABB-ES, 1992a).

2.2 FEDERAL FACILITIES AGREEMENT HISTORY

Field investigation activities at LF-023 have been conducted as part of the Defense Environmental Restoration Program (DERP), which was established to clean up hazardous waste disposal and spill sites at Department of Defense facilities nationwide. The IRP is the U.S. Air Force subcomponent of the DERP that specifically deals with investigating and remediating sites associated with suspected releases of toxic and hazardous materials, such as Plattsburgh AFB. The IRP operates under the scope of CERCLA, as amended by the 1986 Superfund Amendments and Reauthorization Act (SARA).

The Strategic Air Command (SAC) entered into an Interagency Agreement (IAG No. 1758-1758-A1) with the Department of Energy (DOE), under which DOE provides technical assistance for implementation of SAC IRPs and related activities. SAC requested DOE support in assessing the extent of contamination at sites on Plattsburgh AFB. Martin Marietta Energy Systems, Inc. (MMES) was assigned the responsibility for managing the contamination assessment effort under the IAG through the Hazardous Waste Remedial Actions Program. In 1986, the IRP technical performance at Plattsburgh AFB was assigned to ABB Environmental Services, Inc. (ABB-ES), an MMES subcontractor (formerly E.C. Jordan Co.). The IRP at Plattsburgh AFB has included (1) a Preliminary Assessment to evaluate which sites are potentially contaminated, (2) SIs to confirm the presence or absence of contamination at identified sites, and (3) an ongoing RI program at sites confirmed to have contamination. In November 1989, Plattsburgh AFB was included on the National Priorities List (NPL) of sites and will be remediated according to the federal facilities agreement entered into among the U.S. Air Force, the USEPA, and NYSDEC on September 12, 1991.

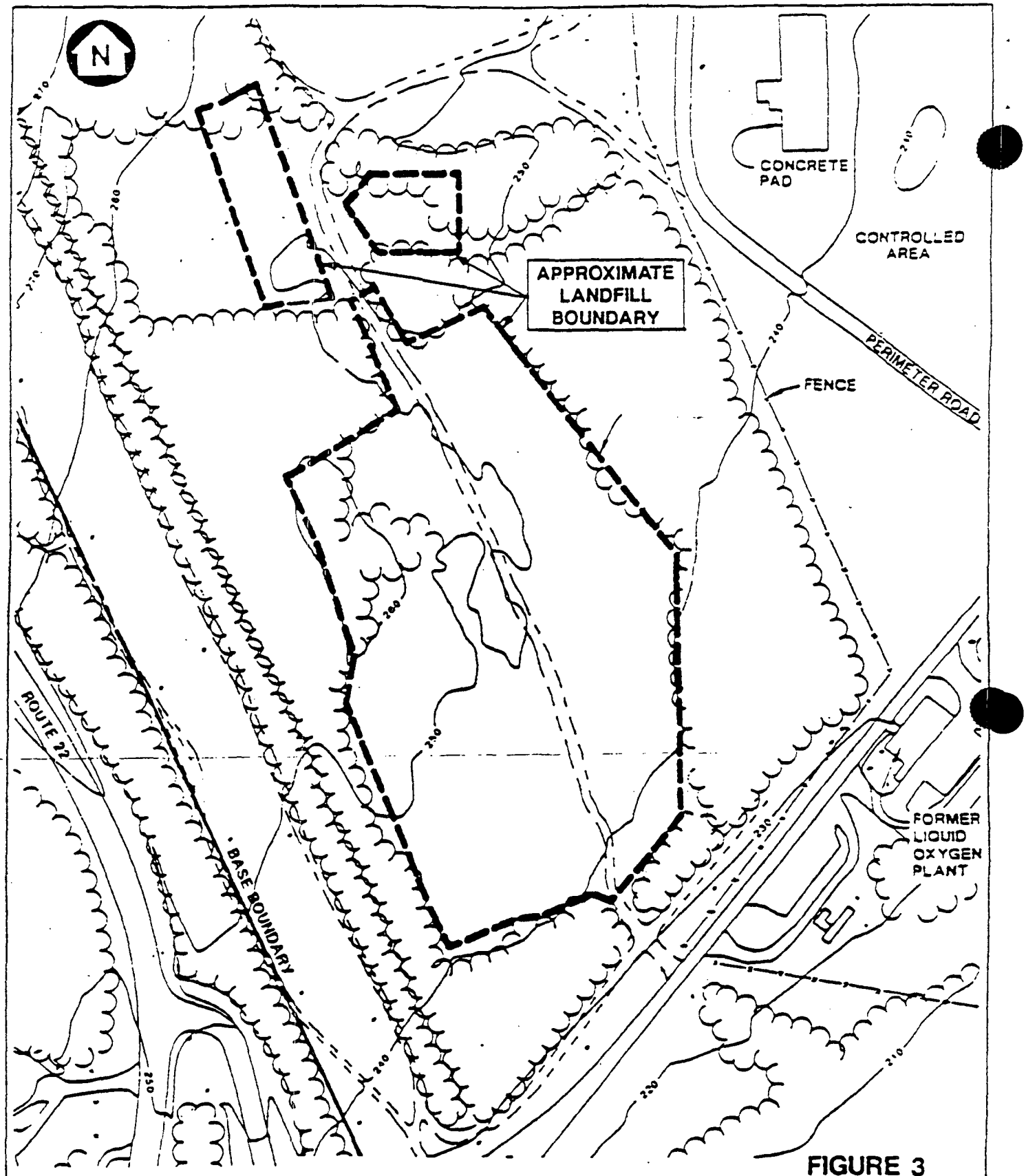


FIGURE 3
LF-023 SITE FEATURES
LF-023 SOURCE CONTROL
RECORD OF DECISION
PLATTSBURGH AFB

ABB Environmental Services, Inc.

3.0 COMMUNITY PARTICIPATION

Throughout Plattsburgh AFB's history, Plattsburgh AFB has kept the community and other interested parties apprised of activities at LF-023 through informational meetings, fact sheets, press releases and public meetings.

On August 1, 1989, Plattsburgh AFB held its first Technical Review Committee (TRC) meeting to involve members of the Clinton County community and state and federal regulatory agencies in decisions concerning IRP environmental response activities. The TRC currently meets quarterly to discuss plans and results of RI and FS activities. During December 1990, Plattsburgh AFB released a community relations plan that outlined a program to address community concerns and keep citizens informed about and involved in activities during the remedial process.

On August 4, 1992, Plattsburgh AFB made the LF-023 Administrative Record available for public review at Plattsburgh AFB in Plattsburgh, New York. Plattsburgh AFB published a notice and brief analysis of the Proposed Plan in the Press-Republican and made the Proposed Plan available to the public at the Plattsburgh Public Library.

On August 4, 1992 Plattsburgh AFB held a public informational meeting to discuss the results of the RI and the cleanup alternatives presented in the FS, present the Proposed Plan, and answer questions from the public. Immediately following the informational meeting, Plattsburgh AFB held a public hearing to discuss the Proposed Plan and to accept oral comments. From August 4, 1992 to September 3, 1992, Plattsburgh AFB held a 30-day public comment period to accept public comment on the alternatives presented in the FS and the Proposed Plan and on any other documents previously released to the public. A transcript of the public hearing, the written comments received during the public comment period, and Plattsburgh AFB's response to comments are included in Appendices C and D.

4.0 SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

Due to the nature of its primary mission, Plattsburgh AFB is engaged in a wide variety of operations. A number of operations require the use, handling, storage, or disposal of hazardous materials. The IRP addresses past instances when these materials came into contact with the environment through accidental spills, leaks in supply piping, landfill operations, burning of waste liquids during fire training exercises, and the cumulative effect of operations conducted at the base's flightline and industrial area. These are the activities and circumstances through which contaminants of concern came into contact with site-related soil, sediment, surface water and/or groundwater. The suspected sources of contamination at Plattsburgh AFB sites are solvents, fuels, pesticides, and polychlorinated biphenyls (PCBs). Currently, there are thirty-nine IRP sites.

The LF-023 source control remedial action will meet most of the remedial response objectives identified for this site. These include:

1. Minimize potential future human health and current and future ecological risks associated with exposure to polynuclear aromatic hydrocarbons (PAHs) in surface soil.

2. Minimize potential future human health risks associated with exposure to vinyl chloride in groundwater.

3. Minimize potential future human health risks associated with exposure to PAHs in dust emissions.

4. Minimize potential risks to aquatic organisms associated with exposure to inorganics in wetland surface water downgradient of LF-023.

5. Minimize infiltration of precipitation into landfilled waste materials.

6. Minimize potential for contaminant migration from waste materials.

7. Minimize erosion of existing cover soils.

Remedial response objectives 2 and 4 will be fully addressed in a separate FS, Proposed Plan, and ROD for groundwater, surface water, and sediment. This source

control remedial action will address the following principal threats to human health and the environment posed by the site: (1) potential future human health risks from exposure to contaminants in site surface soil, and (2) potential effects to terrestrial wildlife from exposure to surface soil contaminants.

5.0 SUMMARY OF SITE CHARACTERISTICS

Subsection 1.4 of the Landfill LF-023 Source Control FS report contains an overview of the RI (ABB-ES, 1992a). The significant findings of the RI are summarized below. Concentrations and frequencies of detection of site contaminants in the various media at LF-023 are presented in Table 1. Figure 4 diagrams potential contaminant migration pathways and receptors.

5.1 WASTE/SOIL

Most of the landfill boundary is defined by large pine trees that predate landfill activities. The boundary was confirmed by a magnetometer survey. The areal extent of two small sections of the landfill, which are north of the main portion of landfill, was defined by a combination of a magnetometer survey and a ground-penetrating radar survey. The area of the landfill is estimated to be 438,000 square feet. The Preliminary Assessment indicated that wastes may have been buried as deep as 25 feet bgs in some areas. Observation during test pit excavation indicated that the landfill is at least 13 feet deep. The maximum volume of fill material is estimated to be 406,000 cubic yards, based on a reported maximum depth of 25 feet.

Test pits were dug during the SI to evaluate the nature of contamination in subsurface soil and buried waste. Material uncovered during test pitting indicates that the type of wastes disposed of at this site ranged from bagged household trash to construction debris and automobile parts. Site contaminants were not detected in subsurface soil; however one waste sample contained 1,2-dichlorobenzene.

A passive soil gas survey was conducted at LF-023 to identify areas of potential contamination and assist in identifying the location of future explorations. Areas of high flux values for some compounds were detected primarily along the dirt road that runs north-south through the site. However, results form subsequent groundwater and surface water sampling do not suggest the presence of contaminant "hot spots".

The site was divided into quadrants for surface soil sampling. Composite surface soil samples were collected from each quadrant and analyzed for semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and inorganics. Discrete surface soil samples were collected from four locations and analyzed for volatile organic compounds (VOCs). The VOC sample locations were selected based

on soil gas survey results. SVOCs (all of which were PAHs), silver, and PCBs (Aroclor 1254) were identified as site surface soil contaminants.

5.2 GROUNDWATER

Groundwater monitoring wells were installed at LF-023 to collect groundwater samples and to measure groundwater elevations. Groundwater at the site contains the following inorganics identified as site contaminants: aluminum, iron, manganese, and potassium. The VOCs detected include chloroform, vinyl chloride, chlorobenzene, benzene, ethylbenzene, and total xylenes. One SVOC, naphthalene, was also detected in one groundwater sample.

5.3 SURFACE WATER/SEDIMENT

Surface water and sediment samples were obtained at seeps approximately 600 feet south of the site to investigate the potential for contaminant transport via groundwater discharge. Aluminum, arsenic, iron, and zinc were detected in surface water at concentrations above Ambient Water Quality Criteria. No target compounds were identified as site contaminants in sediment samples; however, petroleum hydrocarbons (PHCs) were detected in sediment samples.

A complete discussion of site characteristics can be found in the RI report on pages 4-13 through 4-64 (ABB-ES, 1992a).

TABLE 1
LF-023 SITE CONTAMINANTS BY MEDIA

LF-023 SOURCE CONTROL RECORD OF DECISION
PLATTSBURGH AFB

DETECTION	CONCENTRATION RANGE[1] MINIMUM	MAXIMUM	FREQUENCY OF DETECTION[2]
GROUNDWATER (µg/L)			
METALS			
Aluminum	<200	662	2/16
Iron	<100	47,100	3/16
Manganese	<15	954	2/16
Potassium	<5,000	40,000	4/16
VOCs			
Chloroform	<0.2	0.4[4]	2/38
Vinyl Chloride	<0.3	31[5]	3/38
Chlorobenzene	<5	10	1/38
Benzene	<5	14	3/25
Ethylbenzene	<5	54	3/25
Xylenes (Total)	<5	72	4/25
SVOCs			
Naphthalene	<10	11	1/23
SURFACE SOILS[3] (concentrations in µg/kg unless otherwise noted)			
SVOCs			
Fluoranthene	<330	122,500	2/4
Naphthalene	<330	2,725	1/4
2-Methylnaphthalene	<330	2,125	1/4
Acenaphthene	<330	12,825	1/4
Dibenzofuran	<330	7,325	1/4
Phenanthrene	<330	144,000	1/4
Anthracene	<330	25,700	1/4
Pyrene	<330	105,500	2/4
Benzo(a)anthracene	<330	36,500	2/4
Chrysene	<330	35,000	2/4
Benzofluoranthene (Total)	<330	37,000	2/4
Benzo(a)pyrene	<330	21,200	2/4
Indeno (1,2,3-cd)pyrene	<330	4,650	1/4

59213.T/1

continued

TABLE 1
LF-023 SITE CONTAMINANTS BY MEDIA

LF-023 SOURCE CONTROL RECORD OF DECISION
PLATTSBURGH AFB

DETECTION	CONCENTRATION RANGE[1] MINIMUM	MAXIMUM	FREQUENCY OF DETECTION[2]
Dibenzo(a,h)anthracene	<330	2,800	1/4
Fluorene	<330	12,325	1/4
Benzo(g,h,i)perylene	<330	3,850	1/4
PESTICIDES/PCBs			
PCB (Aroclor-1254)	<160	190	1/4
METALS (mg/kg)			
Silver	<2	12.8	2/4
SEDIMENT (mg/kg)			
PHCs	550	1,075	2/2
SURFACE WATER (µg/L)			
Aluminum	<200	1990	1/2
Arsenic	<10	316	1/2
Iron	<100	672,000	2/2
Zinc	<20	355	1/2
WASTE (µg/kg)			
SVOCs			
1,2-Dichlorobenzene	520	520	1/1

Notes:

1 Concentrations of duplicate samples were averaged. When a compound was detected in one duplicate and not the other, an average concentration was calculated by using the detection limit, adjusted for dilution.

2 Number of samples in which the compound was detected above background concentrations or appropriate standards divided by the total number of samples analyzed for that parameter. Duplicate samples were counted as one sample.

3 Concentrations detected in composite samples.

4 Concentrations reported from Method 8010 analyses.

5 Concentrations reported from CLP-COP and Method 8010 analyses.

VOC Volatile Organic Compound
SVOC Semivolatile Organic Compound
PCB Polychlorinated Biphenyl
PHC Petroleum Hydrocarbon

59213.T/2

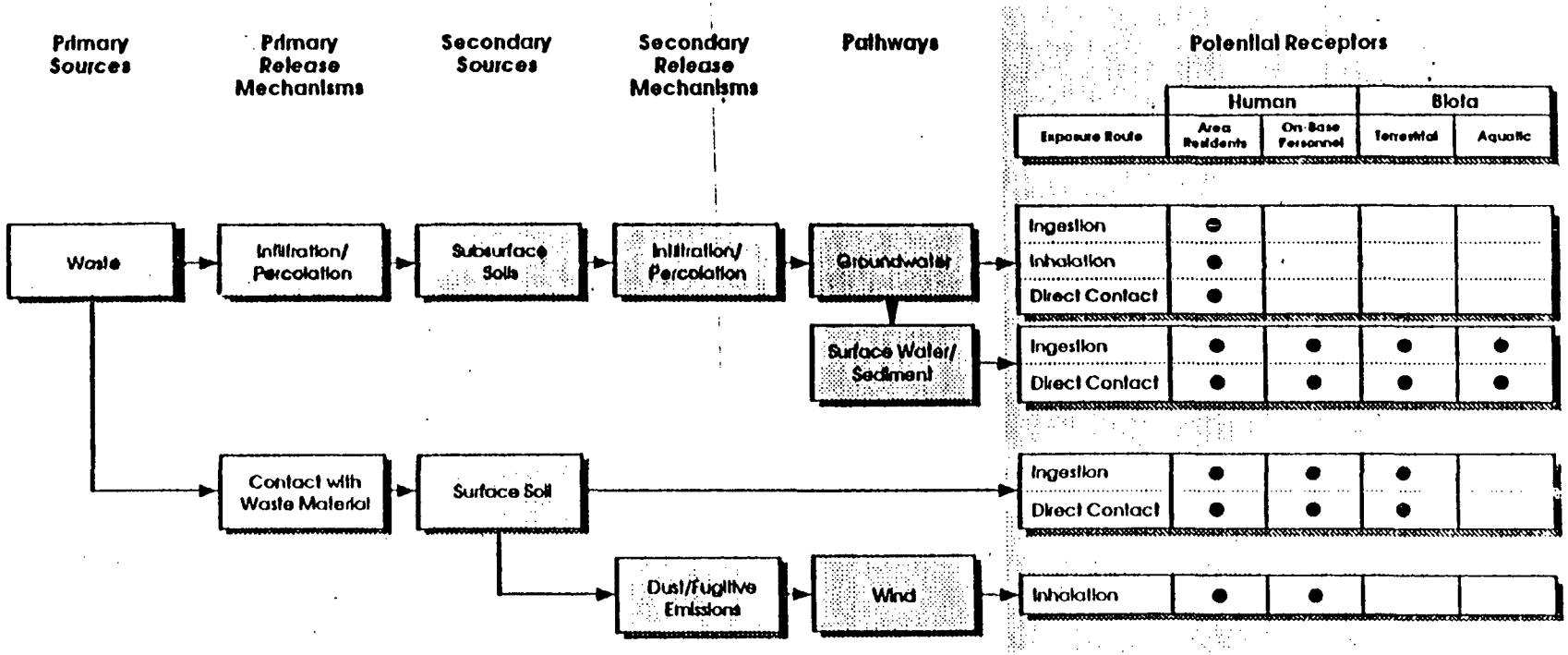


FIGURE 4
LF-023 POTENTIAL MIGRATION PATHWAYS AND RECEPTORS
LF-023 SOURCE CONTROL RECORD OF DECISION
PLATTSBURGH AFB
ABB Environmental Services, Inc.

92020760

6.0 SUMMARY OF SITE RISKS

A risk assessment was performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with LF-023.

6.1 HUMAN HEALTH RISK ASSESSMENT

The human health risk assessment followed a four-step process: (1) data evaluation, that identified those hazardous substances that, given the specifics of the site, were of significant concern; (2) exposure assessment, which identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; (3) toxicity assessment, which considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and (4) risk characterization, which integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and noncarcinogenic risks. The results of the human health risk assessment for LF-023 are discussed below, followed by the conclusions of the environmental risk assessment. The complete risk assessment for LF-023 can be found in Subsection 4.4 of the RI report, with supporting information in Appendices J, M, N, O, and P.

Thirty-two contaminants of concern were selected for evaluation in the risk assessment. These contaminants include all compounds identified as site contaminants at LF-023 during the RI, except PHCs (see Table 1). The 32 contaminants of concern were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment; however, some contaminants were evaluated only in the human health risk assessment, while others were only evaluated in the environmental risk assessment. A summary of the health effects of each of the contaminants of concern can be found on pages 4-82 through 4-88 of the RI report. Toxicity profiles for each compound can be found in Appendix O of the RI report.

Potential human health effects associated with exposure to contaminants of concern were estimated quantitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to hazardous substances based on the present uses, potential future uses, and location of the site. The following is a brief summary of the exposure pathways

evaluated. A more thorough description can be found on pages 4-69 through 4-82 of the RI report.

Eight exposure pathways were evaluated:

Current Site Conditions

1. Incidental ingestion of and direct contact with surface soil by a security policeman.

2. Incidental ingestion of and direct contact with surface soil by a child trespasser.

3. Incidental ingestion of and direct contact with surface water by a child trespasser.

4. Inhalation of vapors and fugitive dusts by a nearby resident.

Future Site Conditions

1. Ingestion of, direct contact with, and inhalation of volatile compounds from groundwater by a future resident.

2. Incidental ingestion of and direct contact with surface soil by a future resident.

3. Incidental ingestion of and direct contact with surface water by a future child resident.

4. Inhalation of vapors and fugitive dusts by a future resident.

Security police use the obstacle course 48 days per year (four days per week, 12 weeks per year) for four years (the average tour of duty). Because they may be exposed to the soil to a greater extent than a typical adult, an ingestion rate of 200 milligrams per day (mg/day) was assumed. Chemical concentrations were averaged over the four quadrants and chemical concentrations in the most contaminated quadrant were used to evaluate risks. Security police are more likely to be exposed to soil in the northeast quadrant (where the obstacle course is located), where silver is the only contaminant of concern detected in surface soils.

Dermal contact and incidental ingestion of soils were evaluated for a child trespasser between the ages of six and 16 years who may be exposed five days per year for the 10-year period. A future resident may also be exposed via this pathway. For the future resident scenario, it was assumed the child would be exposed through childhood and into adulthood. The exposure scenario was evaluated for a child between the ages of one and six years, and an older child/adult between the ages of seven and 30 years. Exposure was assumed to occur 175 days per year for a total of 30 years.

Children between the ages of six and 16 years may also be exposed to surface water in the wetland south of LF-023. Dermal contact and incidental ingestion of surface water was evaluated for a child trespasser five days per year for one hour per day for the 10-year period. Similarly, a future child resident could explore the wetland and be exposed to contaminants there. An exposure frequency of 26 days per year was assumed for the future child resident because access would likely be easier than for a child trespasser.

The inhalation pathway was evaluated for current residents of the mobile home park 600 feet southwest of the site, as well as future residents living on the site. For this pathway, a model was used to predict ambient air concentrations at the nearest residence (200 meters away for the current scenario and 1 meter away for the future scenario). Exposure was evaluated for a resident who may spend 16 hours per day for 175 days per year breathing the predicted air concentrations. This pathway was assumed for a child resident (one to six years old) and adult residents (30-year exposure duration).

Groundwater at the site is not currently used; however, a future resident could be exposed to groundwater via ingestion of the water, dermal absorption during showering or bathing, and inhalation of volatile compounds during showering. These pathways were evaluated together because a future resident could be exposed via all three pathways. Most of the exposure parameters used were default values established by USEPA. Maximum detected concentrations in groundwater were assumed. Air concentrations were calculated using partitioning equations (see Appendix P of the RI report).

Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level with the chemical-specific cancer slope factor. Cancer slope factors have been developed by USEPA from epidemiological or animal studies to reflect a conservative "upper bound" of the risk posed by potentially carcinogenic

compounds. That is, the true risk is very unlikely to be greater than the predicted risk. The resulting risk estimates are expressed in scientific notation as a probability (e.g., 1×10^{-6} for 1/1,000,000) and indicate (using this example) that an individual is not likely to have greater than a one-in-a-million chance of developing cancer over 70 years as a result of site-related exposure (as defined) to the compound at the stated concentration. Current USEPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

The Hazard Index was also calculated for each pathway as USEPA's measure of the potential for noncarcinogenic health effects. The Hazard Index is the sum of Hazard Quotients, which are calculated by dividing the exposure level by the reference dose (RfD) or other suitable benchmark for noncarcinogenic health effects for each compound. RfDs have been developed by USEPA to protect sensitive individuals over the course of a lifetime, and reflect daily exposure levels that are unlikely to have an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. The Hazard Index is often expressed as a single value (e.g., 0.3) indicating the ratio of the stated exposure as defined to the RfD (in this example, the exposure as characterized is approximately one-third of an acceptable exposure level for the given compound). The Hazard Index is only considered additive for compounds that have the same or similar toxic endpoints (e.g., the Hazard Index for a compound known to produce liver damage should not be added to a second whose toxic endpoint is kidney damage).

Tables 2, 3, and 4 depict the carcinogenic and noncarcinogenic risk summaries for current and potential future receptors for the exposure pathways described above. Human health risk calculations can be found in Appendix N of the RI.

All current human health risks were estimated to be below or within the acceptable limits established by USEPA (i.e., carcinogenic risks below or within 10^{-4} and 10^{-6} and noncarcinogenic effects with a Hazard Index of below or equal to 1.0). Three potential future human health risks were estimated to be above acceptable limits. Evaluation of ingestion, direct contact, and inhalation of VOCs in groundwater yielded a risk estimate of 7×10^{-4}. Ninety-eight percent of the total cancer risks via the three exposure pathways are attributable to vinyl chloride. Average and maximum cancer risks for both future child and adult residents via direct contact and incidental ingestion are above acceptable limits. Essentially 100 percent of these risks are attributable to carcinogenic PAHs. Carcinogenic and noncarcinogenic risks

estimated for a future child resident via inhalation of vapors and dusts from the landfill above acceptable limits.

The interpretation of these risk estimates is subject to a number of uncertainties as a result of the multiple layers of assumptions inherent in risk assessment. Many of these assumptions are intended to be protective of human health (i.e., conservative). Therefore, risk estimates are not truly probabilistic estimates of risk, but rather conditional estimates given a series of conservative assumptions about exposure and toxicity. Further information on the uncertainty of risk estimates can be found on pages 4-97 through 4-100 in the RI report.

6.2 ENVIRONMENTAL RISK ASSESSMENT

A habitat-based environmental risk assessment (ERA) was performed for LF-023. Terrestrial wildlife could be exposed to surface soil at the landfill and groundwater seeps in the wetland south of the landfill. There are no aquatic habitats on site, and the wetland to the south is not expected to support fish because standing water is not present throughout the year. However, aquatic invertebrates may live in the wetland and could be exposed to chemicals in the surface water. Selection of aquatic receptors and modeling of exposures was not necessary because chemical concentrations could be compared directly to water quality criteria.

Chronic and acute Hazard Indices for each indicator species exposed to surface soil were between 10^{-5} and 10^{+0}, indicating that effects to individuals may occur, but population effects are unlikely. Effects to terrestrial organisms as a result of exposure to contaminants in the wetland are not likely, based on Hazard Indices between 10^{-3} and 10^{-2}. However, acute and chronic toxicity to aquatic organisms in the wetland may be occurring because the Hazard Indices calculated for this exposure were between 1 and 10.

The ERA for LF-023 is presented on pages 4-100 through 4-111 and Appendix J of the RI report.

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to human health and welfare, and the environment. The following risks must be addressed through this or subsequent remedial activities: (1) potential future human health risks via exposure to vinyl chloride in groundwater, (2) potential future human health risks via exposure to carcinogenic PAHs in site

surface soil, (3) potential future human health risks via inhalation of vapor and dusts from landfill surface soil, (4) potential environmental risks to terrestrial wildlife via exposure to surface soils, and (5) potential environmental risks to aquatic organisms in the wetland. As stated, this ROD addresses risks associated with landfill surface soils. Mitigation of risks associated with groundwater and surface water and sediment in the downgradient wetland will be addressed in a separate ROD.

TABLE 2
SUMMARY OF LF-023 SITE RISK ESTIMATES - SECURITY POLICE

LF-023 SOURCE CONTROL RECORD OF DECISION
PLATTSBURGH AFB

TYPE OF EFFECT	EXPOSURE ROUTE, MEDIUM AND EXPOSURE POINT	PATHWAY-SPECIFIC CANCER RISK OR HAZARD INDEX	TOTAL CANCER RISK OR HAZARD INDEX
CARCINOGENIC EFFECTS			
Site-wide Average	Direct contact with surface soil	8E-05	
	Ingestion of surface soil	1E-05	9E-05
Southeast Quadrant	Direct contact with surface soil	3E-04	
	Ingestion of surface soil	4E-05	3E-04
NONCARCINOGENIC EFFECTS			
Site-wide Average	Direct contact with surface soil	0.06	
	Ingestion of surface soil	0.01	0.07
Southeast Quadrant	Direct contact with surface soil	0.3	
	Ingestion of surface soil	0.05	0.3

TABLE 3
SUMMARY OF LF-023 SITE RISK ESTIMATES - CHILD TRESPASSER

LF-023 SOURCE CONTROL RECORD OF DECISION
PLATTSBURGH AFB

TYPE OF EFFECT	EXPOSURE ROUTE, MEDIUM AND EXPOSURE POINT	PATHWAY-SPECIFIC CANCER RISK OR HAZARD INDEX	TOTAL CANCER RISK OR HAZARD INDEX
CARCINOGENIC EFFECTS			
Site-wide Average	Direct contact with surface soil	6E-06	
	Ingestion of surface soil	3E-06	9E-06
Southeast Quadrant	Direct contact with surface soil	2E-05	
	Ingestion of surface soil	1E-05	3E-05
	Incidental ingestion of surface water	1E-06	
	Direct contact with surface water	3E-08	1E-06
		Total - Site-wide Average	1E-05
		Total - Southeast Quadrant	3E-05
NONCARCINOGENIC EFFECTS			
Site-wide Average	Direct contact with surface soil	0.002	
	Ingestion of surface soil	0.001	0.003
Southeast Quadrant	Direct contact with surface soil	0.01	
	Ingestion of surface soil	0.003	0.01
	Incidental ingestion of surface water	0.006	
	Direct contact with surface water	0.0001	0.006
		Total - Site-wide Average	0.009
		Total - Southeast Quadrant	0.02

TABLE 4
SUMMARY OF LF-023 SITE RISK ESTIMATES - FUTURE RESIDENT

LF-023 SOURCE CONTROL RECORD OF DECISION
PLATTSBURGH AFB

TYPE OF EFFECT	EXPOSURE ROUTE, MEDIUM AND EXPOSURE POINT	PATHWAY-SPECIFIC CANCER RISK OR HAZARD INDEX		TOTAL CANCER RISK OR HAZARD INDEX	
CARCINOGENIC EFFECTS		CHILD	ADULT	CHILD	ADULT
	Direct contact with groundwater	4E-07	1E-06		
	Ingestion of groundwater	6E-04	7E-04		
	Inhalation of volatiles - showering	5E-05	4E-05	7E-04	7E-04
Site-wide Average	Direct contact with surface soil	4E-04	6E-04		
	Ingestion of surface soil	3E-04	1E-04	7E-04	7E-04
Northwest Quadrant	Direct contact with surface soil	1E-03	2E-03		
	Ingestion of surface soil	1E-03	5E-04	2E-03	3E-03
	Incidental ingestion of surface water	2E-07			
	Direct contact with surface water	7E-06		8E-06	
	Inhalation of vapors and dusts	2E-04	1E-04	2E-04	1E-04
		Total: Site-Wide Average		2E-03	2E-03
		Total: Northwest Quadrant		3E-03	4E-03
		Total: Site-wide Average		3E-03	
		Total: Southeast Quadrant		6E-03	
NONCARCINOGENIC EFFECTS		CHILD	ADULT	CHILD	ADULT
	Direct contact with groundwater	0.003	0.002		
	Ingestion of groundwater	0.9	0.2		
	Inhalation of volatiles - showering	0.3	0.06	1.2	0.3
Site-wide Average	Direct contact with surface soil	0.2	0.08		
	Ingestion of surface soil	0.2	0.02	0.4	0.1
Northwest Quadrant	Direct contact with surface soil	0.8	0.4		
	Ingestion of surface soil	1	0.09	2	0.5
	Incidental ingestion of surface water	0.0007			
	Direct contact with surface water	0.03		0.03	
	Inhalation of vapors and dusts	5	0.8	5	0.8
		Total: Site-wide Average		7	1
		Total: Northwest Quadrant		8	2

59213.T/5

7.0 DEVELOPMENT AND SCREENING OF ALTERNATIVES

7.1 STATUTORY REQUIREMENTS/RESPONSE OBJECTIVES

The primary goal at NPL sites is to undertake remedial actions that are protective of human health and the environment. Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that the remedial action, when complete, must comply with all federal and more stringent state environmental standards, requirements, criteria or limitations, unless a waiver is invoked; a requirement that the selected remedial action is cost-effective and uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a preference for remedies in which treatment that permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances is a principal element over remedies not involving such treatment. LF-023 source control alternatives were developed to be consistent with these Congressional mandates.

Based on the types of contaminants, environmental media of concern, and potential exposure pathways, remedial response objectives were developed to aid in the development and screening of alternatives. These remedial response objectives were developed to mitigate existing and future potential threats to human health and the environment:

1. Minimize potential future human health and current and future ecological risks associated with exposure to surface soil contaminants (primarily PAHs).

2. Minimize potential future human health risks associated with exposure to vinyl chloride in groundwater.

3. Minimize potential future human health risks associated with exposure to PAHs in dust emissions.

4. Minimize potential risks to aquatic organisms associated with exposure to aluminum, arsenic, and zinc in wetland surface water downgradient of LF-023.

5. Minimize infiltration of precipitation into landfilled waste materials.

6. Minimize potential for contaminant migration from waste materials.

7. Minimize erosion of existing cover soils.

Remedial response objectives 2 and 4 will be fully addressed in a separate FS, Proposed Plan, and ROD for groundwater, surface water, and sediment.

7.2 TECHNOLOGY AND ALTERNATIVE DEVELOPMENT AND SCREENING

CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) set forth the process by which remedial actions are evaluated and selected (USEPA, 1990a). In accordance with these requirements, a range of alternatives was developed for the site. With respect to source control, the RI/FS developed a limited number of remedial alternatives appropriate for large landfill sites, focusing on attaining response objectives for source control and mitigating risks associated with potential exposure to surface soils. A No Action Alternative was also developed to provide a baseline for comparison against the other alternatives.

As discussed in Subsection 4.1 of the LF-023 Source Control FS (ABB-ES, 1992b), the RI/FS identified, assessed, and screened technologies based on the approach outlined in the NCP and USEPA's *Streamlining the RI/FS for CERCLA Municipal Landfill Sites* (USEPA, 1990b). Subsection 4.2 of the FS presents the remedial alternatives developed by combining the technologies retained from the screening process in the categories identified in Section 300.430(e)(3) of the NCP. Technologies were combined into source control alternatives ranging from an alternative that eliminates the need for long-term management by removing or destroying contaminants to the maximum extent feasible, to alternatives that provide no treatment but do protect human health and the environment. Section 5.0 of the FS presents the initial screening of LF-023 alternatives. The purpose of the initial screening was to narrow the number of potential remedial actions for detailed analysis while preserving a range of options. Each alternative was evaluated and screened based on its effectiveness, implementability, and cost.

In summary, of the five source control remedial alternatives screened in Section 5.0 of the FS, three were retained for detailed analysis. Table 5 identifies the alternatives that were retained through the screening process, as well as those that were eliminated from further consideration.

Table 5
Summary of Alternatives Screening

LF-023 Source Control Record of Decision
Plattsburgh AFB

Alternative		Status
Alternative 1:	No Action	Retained for detailed analysis.
Alternative 2:	Site Grading and Vegetation Establishment	Retained for detailed analysis.
Alternative 3:	Installation of a Low-Permeability Barrier Cover System	Retained for detailed analysis.
Alternative 4:	Excavation and Incineration	Eliminated from further consideration.
Alternative 5:	Stabilization/Solidification	Eliminated from further consideration.

8.0 DESCRIPTION OF ALTERNATIVES

This section provides a narrative summary of each alternative evaluated. A detailed description of each alternative can be found in Section 6.0 of the FS report.

The source control alternatives analyzed for LF-023 include Alternative 1: No Action, Alternative 2: Site Grading and Vegetation Establishment for Closure, and Alternative 3: Installation of a Low-permeability Barrier Cover System.

8.1 ALTERNATIVE 1: NO ACTION

The No Action Alternative (Alternative 1) provides a baseline against which the other alternatives can be compared, and also assesses the effects on human health and the environment if no remedial actions are taken. The No Action Alternative includes a program to monitor the status of groundwater and surface water quality, with five-year reviews to evaluate how human health and the environment are protected. This monitoring program would meet the relevant and appropriate requirements of Part 360 of the New York State Solid Waste Management Facility Rules for closure and post-closure of solid waste landfills (hereinafter referred to as Part 360) requirements for long-term monitoring. The No Action Alternative would not meet the remedial response objectives.

Estimated Time for Construction (installation of a groundwater monitoring well): 3 days

Estimated Time of Operation: 30 years

Estimated Capital Cost: $9,000

Estimated Operation and Maintenance (O&M) Costs (30 years, net present worth assuming a 10 percent discount factor): $784,000

Estimated Total Costs (30 years, net present worth assuming a 10 percent discount factor): $793,000

8.2 ALTERNATIVE 2: SITE GRADING AND VEGETATION ESTABLISHMENT FOR CLOSURE

This alternative (Alternative 2) consists of a soil cover (i.e., no low-permeability layer) to support grass growth and reduce precipitation infiltrating to buried wastes. The alternative includes:

1. Clearing and grubbing of the site.
2. Surface water runoff management to minimize erosion of the cover and minimize maintenance requirements.
3. Soil cover installation.
4. Vegetation establishment to minimize erosion of the final cover and enhance evapotranspiration.
5. Post-closure plan development to monitor, maintain, and inspect the site.
6. Groundwater and surface water monitoring.
7. Five-year site reviews.

This alternative would only slightly reduce the infiltration of precipitation through the wastes from current levels, and therefore would not minimize the potential for contaminant migration from wastes to groundwater.

Estimated Time for Construction: 3 months

Estimated Time of Operation: 30 years

Estimated Capital Cost: $987,000

Estimated O&M Costs (30 years, net present worth assuming a 10 percent discount factor): $988,000

Estimated Total Costs (30 years, net present worth assuming a 10 percent discount factor): $1,975,000

8.3 ALTERNATIVE 3: INSTALLATION OF A LOW-PERMEABILITY BARRIER COVER SYSTEM

Alternative 3 consists of a low-permeability cover system to achieve the response objectives identified in Section 7.0. The alternative includes:

1. Clearing and grubbing of the site.
2. Surface water runoff management to minimize erosion of the cover and minimize maintenance requirements.
3. Installation of a gas detection and management system.
4. Construction of a barrier layer.
5. Placement of a barrier protection layer.
6. Installation of a vegetative cover layer.
7. Vegetation establishment to minimize erosion of the final cover and enhance evapotranspiration.
8. Post-closure plan development to monitor, maintain, and inspect the site.
9. Groundwater and surface water monitoring.
10. Five-year site reviews.

This alternative would greatly reduce both infiltration of precipitation through the wastes, and minimize the potential for contaminant migration from wastes to groundwater. This alternative would meet the source control response objectives.

Estimated Time for Construction: 4 months

Estimated Time of Operation: 30 years

Estimated Capital Cost: $3,586,000

Estimated O&M Costs (30 years, net present worth assuming a 10 percent discount factor): $988,000

Estimated Total Costs (30 years, net present worth assuming a 10 percent discount factor): $4,574,000

9.0 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

Section 121(b)(1) of CERCLA presents several factors that, at a minimum, Plattsburgh AFB is required to consider in its assessment of alternatives. Building upon these specific statutory mandates, the NCP articulates nine evaluation criteria to be used in assessing the individual remedial alternatives.

A detailed analysis of alternatives was performed using the nine evaluation criteria to select a site remedy. These criteria and their definitions are discussed in the following subsections.

9.1 THRESHOLD CRITERIA

The two threshold criteria described below must be met in order for the alternatives to be eligible for selection in accordance with the NCP.

- **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

- **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether or not a remedy will meet all of the ARARs of other federal and state environmental laws and/or provide grounds for invoking a waiver.

9.2 PRIMARY BALANCING CRITERIA

The following five criteria are used to compare and evaluate the elements of one alternative to another that meet the threshold criteria.

- **Long-term effectiveness and permanence** assesses alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

- **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principal threats posed by the site.

- **Short-term effectiveness** addresses time needed to achieve protection and any adverse impacts on human health and the environment.

- **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

- **Cost** includes estimated capital and O&M costs, as well as present-worth costs.

9.3 MODIFYING CRITERIA

The modifying criteria are used on the final evaluation of remedial alternatives after Plattsburgh AFB has received public comment on the RI/FS and Proposed Plan.

- **State acceptance** addresses New York State's position and key concerns related to the preferred alternative and other alternatives, and New York State's comments on ARARs or the proposed use of waivers.

- **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and RI/FS report.

9.4 CRITERIA SUMMARY

A detailed tabular assessment of each alternative according to the nine criteria can be found in Tables 6-4, 6-7, and 6-9 of the FS report (ABB-ES, 1992b).

Following the detailed analysis of each individual alternative, a comparative analysis, focusing on the relative performance of each alternative against the nine criteria, was conducted. This comparative analysis can be found in Table 7-1 of the FS report.

The subsections below present the nine criteria and a brief narrative summary of the alternatives and the strengths and weaknesses according to the detailed and comparative analyses.

9.4.1 Overall Protection of Human Health and the Environment

Alternatives 2 and 3 would both minimize the potential human health and ecological risks associated with surface soil exposures. Alternative 2 would only slightly reduce precipitation infiltrating to the wastes; consequently, the potential for contaminant migration from waste material to groundwater would not be minimized. Alternative 3 would minimize the infiltration of precipitation, thereby reducing the potential for contaminant migration from waste material to groundwater. Alternative 1, the No Action Alternative, would not include any measures to protect human health or the environment.

9.4.2 Compliance with Applicable or Relevant and Appropriate Requirements

Alternative 3 meet the relevant and appropriate requirements of Part 360 for final cover systems governing landfill closure. Alternative 2 would comply with some but not all Part 360 requirements. Alternative 1 would not comply with Part 360 regulations for landfill closure.

9.4.3 Long-term Effectiveness and Permanence

Alternative 3 would provide the greatest long-term effectiveness by (1) reducing potential human health and ecological risks associated with surface soil exposures, (2) significantly reducing the infiltration of precipitation through the cover system, and (3) reducing the net leachate discharge to the wetland. Alternative 2 would not effectively reduce the potential for contaminant migration to groundwater because only a slight reduction of infiltration through the cover system is expected. Alternative 1 would provide the least long-term protection because it would not meet any remedial response objectives.

9.4.4 Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment are three principal measures of the overall performance of an alternative. This criterion essentially does not apply to the source control alternatives evaluated for LF-023,

because treatment would not be employed as a principal element. Treatment is a statutory preference under CERCLA; however, cover systems are often more appropriate for landfill sites such as LF-023.

9.4.5 Short-term Effectiveness

Short-term impacts are not anticipated for Alternative 1 because no remedial actions would be implemented. Alternatives 2 and 3 would result in similar direct short-term impacts to potential ecological receptors from clearing and grubbing activities.

9.4.6 Implementability

The implementability of Alternatives 2 and 3 would be similar; however, a suitable borrow source for the low-permeability hydraulic barrier material must be identified before implementation of Alternative 3, unless a synthetic liner is used instead. Alternative 1 would be readily implementable because no remedial actions would be conducted.

9.4.7 Cost

Alternative 1 would be the least expensive because it would involve no remedial actions. Alternative 3 would be the most costly of the two cover system alternatives; however, the increased cost is associated primarily with the hydraulic barrier cover materials.

9.4.8 State Acceptance

The State Acceptance criterion has been addressed by incorporating comments received from NYSDEC on behalf of the state on the Proposed Plan. The state has had the opportunity to review and comment on all documents produced for LF-023. New York State concurs with the selected remedy for LF-023 source control (see Appendix B).

9.4.9 Community Acceptance

Plattsburgh AFB has not received public comment on the LF-022 Proposed Plan. If the public had commented on the Proposed Plan, the comments would have been addressed in the Responsiveness Summary attached as an appendix to this ROD.

10.0 THE SELECTED REMEDY

Plattsburgh AFB has chosen Alternative 3 as the selected remedy for LF-023 because it addresses source control response objectives for LF-023. Response objectives for groundwater, surface water, and sediment contamination will be addressed further in a separate FS, Proposed Plan, and ROD. Source remediation at LF-023 will be consistent with future groundwater remedies and will mitigate releases of hazardous substances from the former landfill to groundwater.

10.1 CLEANUP LEVELS

Cleanup levels have not been established for the surface soil contaminants of concern (primarily PAHs). Chemical-specific ARARs are not available for contaminants in soil. In the absence of a chemical-specific ARAR, or other suitable criteria to be considered (TBC), a 10^{-6} excess cancer risk level for carcinogenic effects or a concentration corresponding to a Hazard Index of 1.0 for compounds with noncarcinogenic effects is typically used to set cleanup levels. Risk-based target cleanup levels were not developed for LF-023 source control because discrete source areas (i.e., hot spots) were not found. Remedial alternatives developed for LF-023 included containment options to address the entire landfill area and treatment options to address all landfilled soil and waste. These alternatives were developed to address mitigation of surface soil risks and the potential for contaminants leaching to groundwater. The Hydrologic Evaluation of Landfill Performance (HELP) model was used to evaluate expected performance (i.e., amount of water that can percolate through the waste) of the three alternatives. HELP model results were used to calculate dilution factors for the shallow LF-023 aquifer for two scenarios (i.e., Alternatives 1 and 3). Based on this analysis, a 2.7-fold improvement in downgradient groundwater quality is expected for Alternative 3 over baseline conditions.

Cleanup levels for other contaminated media associated with the site will be developed in the FS for groundwater, surface water, and sediment, if appropriate.

Periodic assessments of the protection afforded by remedial actions (i.e., five-year site reviews) will be made as the remedy is being implemented and at the completion of the remedial action. If the source control remedial action is not found to be protective, further action will be required.

10.2 DESCRIPTION OF REMEDIAL COMPONENTS

The Installation of a Low-permeability Barrier Cover System (i.e., Alternative 3) consists primarily of a low-permeability cover system to achieve the response objectives identified in Section 7.0 of this document.

Existing vegetation such as trees and brush would be cleared, grubbed, and removed from the site. The cleared site would be regraded to control rainwater runoff and minimize erosion. The installation of a gas detection system around the landfill would be used to monitor for the presence or migration of methane and other landfill gases after closure of LF-023. A gas management system also would be part of the landfill cover including venting pipes between a gas-venting soil layer and the cover system surface.

The cover's barrier layer would be constructed of a synthetic liner to keep rainwater or snowmelt from infiltrating the landfill. The low-permeability barrier layer is covered by a soil barrier protection layer to protect the barrier layer from frost or root penetration. The additional soil over the barrier layer will provide an area for small plants to root. However, large plants requiring deeper soil for their root systems will not be allowed to grow over the barrier cover in order to prevent root penetration into the synthetic liner. Six inches of topsoil would be placed on top of the barrier protection layer to plant grass, which will minimize soil erosion and enhance evapotranspiration.

A post-closure plan will be developed specifying the inspection, monitoring, and maintenance programs for the closed landfill to be continued for 30 years. These post-closure activities will be subject to five-year site reviews as required by the NCP when contaminants remain at the site. In addition, institutional controls for this site will be incorporated into the Plattsburgh AFB Comprehensive Plan. This will ensure that future owners will be made aware of the landfill location and are informed that the integrity of the final covers, liners, or any other component of the containment or monitoring system must not be compromised.

11.0 STATUTORY DETERMINATIONS

The remedial action selected for implementation at LF-023 is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is cost-effective. The selected remedy uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable for this site. However, it (as well as the other alternatives evaluated) does not satisfy the statutory preference for a treatment which permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as a principal element.

11.1 THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The remedy at LF-023 will permanently reduce the risks posed to human health and the environment by eliminating, reducing, or controlling exposures to human and environmental receptors through engineering controls (i.e., low-permeability barrier cover system). Moreover, the selected remedy will minimize infiltration of precipitation into landfilled waste material and minimize the potential for contaminant migration from waste materials. Finally, implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts because the selected remedy includes elements to mitigate potential impacts (e.g., erosion control measures, gas detection and management, and maintenance and monitoring programs).

11.2 THE SELECTED REMEDY ATTAINS ARARS

This remedy will attain all federal and state requirements that apply or are relevant and appropriate to the site and selected source control remedy. ARARs that pertain to groundwater, surface water, and sediment will be identified for these media in separate FS and ROD documents, and selected remedies for those media will be required to comply with ARARs. Environmental laws from which ARARs for the

selected source control remedial action are derived, and the specific ARARs, are listed below.

Applicable or Relevant and Appropriate Requirements:

Location-specific:

- Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.), relevant and appropriate because of the regulated wetland downgradient of LF-023.

- National Environmental Policy Act (40 CFR Part 6), Appendix A (except for floodplain requirements), relevant and appropriate because of the regulated wetland downgradient of LF-023.

- Clean Water Act, Section 404, relevant and appropriate because of the regulated wetland downgradient of LF-023.

- NYSDEC Freshwater Wetlands Regulations (6 NYCRR Parts 662 through 665), relevant and appropriate because of the regulated wetland downgradient of LF-023.

Chemical-specific:

No federal or state chemical-specific ARARs have been promulgated for contaminants in soil. However, the following chemical-specific ARARs and guidelines pertain to potential air emissions resulting from construction activity at the site:

- Clean Air Act (40 CFR Part 50), applicable for particulate matter (e.g., fugitive dusts) entrained in air during clearing, grading, cover system construction activities.

- NYSDEC Ambient Air Quality Standards (6 NYCRR Part 257), applicable for particulate matter (e.g., fugitive dusts) entrained in air during clearing, grading, cover system construction activities.

Action-specific:

- NYSDEC Solid Waste Management Facility Rules (6 NYCRR Part 360), applicable to solid waste landfills, specifies closure and post-closure criteria.

- Fish and Wildlife Coordination Act (16 U.S.C. 661, et seq.), relevant and appropriate because of the regulated wetland downgradient of LF-023.

- National Environmental Policy Act (40 CFR Part 6), Appendix A (except for floodplain requirements) is relevant and appropriate because of the regulated wetland downgradient of LF-023.

- Clean Water Act, Section 404, relevant and appropriate because of the regulated wetland downgradient of LF-023.

- Clean Air Act (40 CFR Part 50), applicable for particulate matter (e.g., fugitive dusts) entrained in air during clearing, grading, cover system construction activities.

- Occupational Safety and Health Administration Regulations (29 CFR Parts 1904, 1910, and 1916), applicable for all work conducted on site.

- NYSDEC Freshwater Wetlands Regulations (6 NYCRR Parts 662 through 665), relevant and appropriate because of the regulated wetland downgradient of LF-023.

- NYSDEC Use and Protection of Waters, Excavation, and Placement of Fill in Navigable Water (6 NYCRR Section 608.4), relevant and appropriate because of the regulated wetland downgradient of LF-023.

- NYSDEC Division of Air Resources Regulations (6 NYCRR Parts 200-202, 257), applicable for particulate matter (e.g., fugitive dusts) entrained in air during clearing, grading, cover system construction activities, and emissions from landfill gas vents.

- New York State Air Pollution Control Regulations (6 NYCRR Chapter 3, Part 212), applicable if pollution control equipment is required as part of the gas management system.

A more detailed discussion of why these requirements are applicable or relevant and appropriate may be found in the FS report on pages 3-1 through 3-8 and 4-9 through 4-16. Within these pages of the FS report, other laws that are not applicable or relevant and appropriate to this site are discussed and the rationale for their exclusion as ARARs is presented.

Federal and State Nonregulatory Criteria:

In addition to the federal and state ARARs, federal and state non-promulgated advisories or guidance may be considered when ARARs for specific contaminants are not available. The following policies, criteria, and guidance (i.e., TBCs) were considered:

- New York Air Guide - 1, Guidelines for the Control of Toxic Ambient Air Contaminants, guidance to be considered for landfill gas management.

- USEPA Health Advisories, USEPA RfDs, and USEPA Human Health Assessment Group Cancer Slope Factors, criteria used in the preparation of the baseline risk assessment for LF-023.

11.3 THE SELECTED REMEDIAL ACTION IS COST-EFFECTIVE

In Plattsburgh AFB's judgment, the selected remedy is cost-effective (i.e., the remedy affords overall effectiveness proportional to its costs). In selecting this remedy, once Plattsburgh AFB identified alternatives that are protective of human health and the environment and that attain ARARs, Plattsburgh AFB evaluated the overall effectiveness of each alternative by assessing the relevant three criteria: long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term effectiveness, in combination. The relationship of the overall effectiveness of this remedial alternative was determined to be proportional to its costs. The costs of this remedial alternative are:

Estimated Capital Cost: $3,586,000

Estimated O&M Costs (30 years, net present worth assuming a 10 percent discount factor): $988,000

Estimated Total Costs (30 years, net present worth assuming a 10 percent discount factor): $4,574,000

Alternative 3 is considered the most cost-effective alternative because it provides the most protection against contaminant leaching and meets the relevant and appropriate requirements of Part 360 regulations, as compared to Alternatives 1 or 2. Alternative 3 is similar to Alternative 2 in regard to short-term impacts. None of the alternatives evaluated in detail include a treatment component.

11.4 THE SELECTED REMEDY UTILIZES PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the source control remedial action, and is cost-effective. The selected remedy uses permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable for this site.

The source control remedy was selected by deciding which one of the identified alternatives provides the best balance of trade-offs among alternatives in terms of: (1) long-term effectiveness and permanence; (2) reduction of toxicity, mobility, or volume through treatment; (3) short-term effectiveness; (4) implementability; and (5) cost. The balancing test emphasized long-term effectiveness and permanence and the reduction of toxicity, mobility, and volume through treatment; and considered the preference for treatment as a principal element, the bias against off-site land disposal of untreated waste, and community and state acceptance. The selected remedy provides the best balance of trade-offs among the alternatives.

The principal element of the selected remedy is source control. This element addresses the primary threats at LF-023: human health and environmental risks associated with surface soil contamination and potential leaching of contaminants from the waste to groundwater. The selected remedy was chosen primarily because it affords the most protection to human health and the environment, even though its increased level of protection over the other alternatives makes it slightly more difficult to implement and more costly. The short-term effects of implementing the selected remedy are comparable to Alternative 2. None of the three source control

alternatives evaluated in the FS included a treatment component to reduce toxicity, mobility, or volume.

The selected alternative complies with state regulations governing closure and post-closure of solid waste landfills, and NYSDEC has had the opportunity to review and comment on all documents produced for LF-023. State and public comments received on LF-023 Source Control to date have been incorporated into this ROD for the site.

11.5 THE SELECTED REMEDY DOES NOT SATISFY THE PREFERENCE FOR TREATMENT THAT PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY, OR VOLUME OF THE HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

Because treatment of the principal threats at the site was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. Treatment technologies were considered during the identification of remedial technologies and the development and initial screening of alternatives, but were considered to be infeasible for the LF-023 landfill site. The size of the landfill and the fact that there are no on-site hot spots representing the major sources of contamination preclude a remedy in which contaminants could be excavated and treated effectively. The FS report to be prepared for other site media (i.e., groundwater, surface water, and sediment) will consider treatment options if cleanup goals are appropriate for those media.

12.0 DOCUMENTATION OF NO SIGNIFICANT CHANGES

Plattsburgh AFB presented a Draft Final Source Control Proposed Plan for the preferred alternative for remediation of LF-023 in August 1992. The preferred alternative for source control included:

1. Clearing and grubbing of the site.
2. Surface water runoff management to minimize erosion of the cover and minimize maintenance requirements.
3. Installation of a gas detection and management system.
4. Construction of a barrier layer.
5. Placement of a barrier protection layer.
6. Installation of a vegetative cover layer.
7. Vegetation establishment to minimize erosion of the final cover and enhance evapotranspiration.
8. Post-closure plan development to monitor, maintain, and inspect the site.
9. Groundwater and surface water monitoring.
10. Five-year site reviews.

The chosen remedial action does not differ from the preferred alternative presented in the Proposed Plan.

13.0 REGULATORY ROLE

The EPA and NYSDEC have reviewed the various alternatives and have indicated their support for the selected remedy. The EPA and NYSDEC have also reviewed the RI, risk assessment, and FS to determine if the selected remedy is in compliance with applicable or relevant and appropriate federal and New York State environmental laws and regulations. The EPA and NYSDEC concur with the selected remedy for LF-023 source control. The EPA indicates its concurrence with the LF-023 source control ROD by cosigning the document with Plattsburgh AFB. A copy of the NYSDEC declaration of concurrence is attached as Appendix B.

ABB Environmental Services, Inc. (ABB-ES), 1992a. "Installation Restoration Program (Remedial Investigation/Feasibility Study) at Plattsburgh Air Force Base, New York; Final Landfills LF-022/LF-023 Remedial Investigation Report"; Portland, Maine; February.

ABB Environmental Services, Inc. (ABB-ES), 1992b. "Installation Restoration Program (Remedial Investigation/Feasibility Study) at Plattsburgh Air Force Base, New York; Draft Final Landfill LF-023 Source Control Feasibility Study Report"; Portland, Maine; March.

U.S. Environmental Protection Agency (USEPA), 1990a. "National Oil and Hazardous Substances Pollution Contingency Plan:" 40 CFR Part 300; Washington, D.C.; March 8.

U.S. Environmental Protection Agency (USEPA), 1990b. "Streamlining the RI/FS for CERCLA Municipal Landfill Sites"; Office of Emergency and Remedial Response Hazardous Site Control Division; Washington, D.C.; September.

ABB-ES	ABB Environmental Services, Inc.
AFB	Air Force Base
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (the Superfund statute)
DERP	Defense Environmental Restoration Program
DOE	Department of Energy
ERA	environmental risk assessment
FS	Feasibility Study
HELP	Hydrologic Evaluation of Landfill Performance
IAG	Interagency Agreement
IRP	Installation Restoration Program
mg/day	milligrams per day
MMES	Martin Marietta Energy Systems, Inc.
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
O&M	operation and maintenance
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PHC	petroleum hydrocarbon
RfD	risk reference dose
RI	Remedial Investigation
ROD	Record of Decision
SAC	Strategic Air Command

SARA	Superfund Amendments Reauthorization Act
SI	site inspection
SVOC	semivolatile organic compound
TBC	to be considered
TRC	Technical Review Committee
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

APPENDIX A - ADMINISTRATIVE RECORD INDEX

PLATTSBURGH AFB ADMINISTRATIVE RECORD DOCUMENT INDEX
SITE LF-023

DOC #	TYPE	SUBJECT	FROM	TO	DATE
LF-023		1.0 Site Identification			
1.10	R	IRP Records Search-see Doc. M-1	Radian Corp, McClean Va	Plattsburgh AFB	APR 85
		1.6 Site Inspection			
1.61	R	See document No M-8, Site Inspection Report	E.C. Jordan Co Portland	Plattsburgh AFB, NY	JUL 89
1.62	R	See document No M-9, Appendix I			JUL 89
1.63	R	See document No M-10, Appendix II			JUL 89
		3.0 Remedial Investigation (RI)			
LF-023		3.1 Sampling and Analysis--see also LF-022/LF-023 RI Report Appendices-LF-022 3.46			
3.10	D	LF-022/LF-023 RI Report-Laboratory Blank Data	ABB Env. Svcs, Inc.	Doug Draper, HAZWRAP	13 NOV 91
3.11	L	Analytical Data for FT-002 and LF-023	J. Huru, PE, PAFB	Wm. Roach, PE, USEPA	12 DEC 91
3.12	L	Analytical Data for FT-002 and LF-023	J. Huru, PE, PAFB	J Lister, PE, NYSDEC	12 DEC 91
3.13	D	LF-023 well 23-006 groundwater results	J. Huru, PE, PAFB	distribution list (inc)	13 JAN 92
3.14	L	Validated sample results- LF-022 and LF-023	Col. Hrapla, PAFB	Wm. Roach, PE, USEPA	13 FEB 92
3.15	L	Validated sample results- LF-022 and LF-023	Col. Hrapla, PAFB	J Lister, PE, NYSDEC	13 FEB 92
3.16	D	Laboratory Results-Old Rt. 22, 3 FEB 92	Aquatec, Inc.	Stanley Holland, PAFB	19 FEB 92
		3.4 RI reports and comments			
3.40	L	NYSDEC Comments on LF-022/LF-023 RI Report	J Lister, PE, NYSDEC	P.Von Bargen, PAFB	15 OCT 91
3.41	L	Scope of Work for Further investigation	Alliance Tech. Corp	Wm. Roach, PE, USEPA	02 JAN 91
3.42	L	Resp. to Comments on LF-022/LF-023 RI Report	J. Huru, PE, PAFB	Wm. Roach, PE, USEPA	31 DEC 91
3.43	L	Resp. to EPA Comments on LF-022/023 RI Report	J. Huru, PE, PAFB	J Lister, PE, NYSDEC	31 DEC 91
3.44	R	Meeting Minutes, LF-022/LF-023 RI/FS	Plattsburgh AFB	Attendees	04 MAR 92
3.45	L	NYSDEC comments-LF-022/LF-023 Final RI Report	J Lister, PE, NYSDEC	Al Rascoe, PE, PAFB	23 MAR 92
3.46	L	USEPA comments-LF-022/LF-023 Final RI Report	Wm. Roach, PE, USEPA	P. Maloy, PAFB	26 MAR 92
3.47	L	EPA approval of LF-022/LF-023 Final RI Report	Wm. Roach, PE, USEPA	Al Rascoe, PE, PAFB	08 APR 92
3.48	R	LF-022/LF-023 RI Report-Final	ABB Env. Svcs, Inc.	Plattsburgh AFB	FEB 92
3.49	R	LF-022/LF-023 RI Report-Final-Appendices--	ABB Env. Svcs, Inc.	Plattsburgh AFB	FEB 92
		4.0 Feasibility Study (FS)			
4.05	L	Identification of ARARS for LF-022 and LF-023	ABB Env. Svcs, Inc.	Doug Draper, HAZWRAP	26 SEP 91
4.10	L	Resp to Comm-LF-023 screening of Alternatives	ABB Env. Svcs, Inc.	Doug Draper, HAZWRAP	21 OCT 91
4.11	L	NYSDEC Comments on LF-023 FS Report	J Lister, PE, NYSDEC	Al Rascoe, PE, PAFB	29 NOV 91
4.12	L	USEPA Comments on LF-023 FS Source Control	Wm. Roach, PE, USEPA	Al Rascoe, PE, PAFB	17 DEC 91
4.13	L	NYSDEC Comments on LF-023 FS Source Control	J Lister, PE, NYSDEC	Al Rascoe, PE, PAFB	07 APR 92
4.14	L	USEPA Approval of LF-023 FS Source Control	Wm. Roach, PE, USEPA	Al Rascoe, PE, PAFB	13 APR 92
4.15	L	NYSDEC Comm.-LF-023 screening of Alternatives	J Lister, PE, NYSDEC	Al Rascoe, PE, PAFB	13 APR 92
4.16	L	USEPA Comm.-LF-023 screening of Alternatives	Wm. Roach, PE, USEPA	Al Rascoe, PE, PAFB	13 MAY 92
4.17	R	Landfill LF-023 Source Control FS-Final	ABB Env. Svcs, Inc.	Plattsburgh AFB	MAY 92
4.18	L,R	Landfill LF-023 Supp. Field Inv.(Work Plan)	J. Huru, PE, PAFB	Wm. Roach, PE, USEPA	15 JUN 92
4.20	R	Landfill LF-023 Proposed Remedial Action Plan	ABB Env. Svcs, Inc.	Plattsburgh AFB	JUN 92
4.21	L	NYSDEC Comments on LF-023 Draft PRAP	Michael J O'Toole NYSDEC	Al Rascoe, PE, PAFB	3 JUN 92
4.22	L	USEPA Comments on LF-023 Draft PRAP	Wm. Roach, PE, USEPA	Al Rascoe, PE, PAFB	2 JUN 92
		8.0 Health Assessments			
8.10	L,R	Landfill LF-022/LF-023 Risk Assessment, based on unfiltered sampling results	J. Huru, PE, PAFB J. Huru, PE, PAFB	Wm. Roach, PE, USEPA J Lister, PE, NYSDEC	15 JUN 92 15 JUN 92

NOTE: TYPE BLOCK MEANINGS-- L=Letter M=Message D=Data R=Report

APPENDIX B - STATE LETTER OF CONCURRENCE

The State letter of concurrence will be placed here after NYSDEC reviews and concurs with the Draft Final ROD.

APPENDIX C - PUBLIC MEETING TRANSCRIPT

COL LIAS: We simply stated to the reporters that we're very concerned. We're going to restore. We're going to comply. (inaudible) And we're very proud of our accomplishments in these areas, and I'll mention two of those here in a second. Hopefully, you're all familiar with them. The other goal that we had related to the community. We want to be good neighbors. We are members and we are co-inhabitants of the lovely north country, wedged here between Lake Champlain and the Adirondacks. And to be a good neighbor, we've got to be just as kind to the environment as possible. So, those are our goals. They're right up there with the rest of our goals, and we take them very seriously. The (inaudible) this past year are a team of real professionals working on environmental issues and they've won numerous awards. And I'm going to have to get a card to read them because I can't remember them all. The Strategic Air Command in 1991, they won the Thomas E. White award competition for winner of the installation individual awards for environmental compliance; winner of the installation individual awards for environmental restoration. We won the installation individual awards for pollution prevention. At the Air Force level, we won the installation award for environmental compliance. We also received honorable mentions in the award for pollution--environmental restoration, pollution prevention. And at the Department of Defense level, we're currently competing for the 1991 Thomas E. White award for--installation award environmental compliance. We're keeping our fingers crossed, because we know that we're a leading force in that competition, and we're very proud of it. And our people are very proud of that because it takes more than just our environmental technicians that work in Civil Engineering. It takes (inaudible) wrench bender who works down in the maintenance shops to be aware. It takes the guys--our civilians that worked here for years to bring areas of possible problems to the staff, our environmental people, and we go out there and research it. (inaudible) talk about it tonight. The purpose of this meeting is to inform the people of our findings and our recommended remedies, and the environmental impacts of our selected remedial alternatives regarding two landfills. And I'll turn it over to our experts. Hopefully, you'll find (inaudible).

PURSER: Thank you, sir. My name is Lieutenant Darren Purser and I'm the Deputy Chief of Public Affairs here at Plattsburgh Air Force Base. Basically, I just wanted to introduce you to the speakers, as well as some of our guests. To my left is Mr. Phil Von Bargen, who is our IRP remedial project manager, Ms. Rachel Becker, our IRP chemical engineer, and in the audience we're pleased to have Mr. Jim Lister, a state regulator, Mr. Bill Roach with the EPA, and Mr. Tom Lawson from URS, which is one of our engineering facilities. At this point,

PURSER: basically, I wanted to run down the list of our community involvement between us and our neighbors regarding the IRP, one of which is fact sheets. We've had a series of fact sheets in print, and tonight we are releasing four more. It basically gives an overview and kind of sums up what the IRP program is all about. The administrative record is here at Plattsburgh Air Force Base and contains all the documents leading up to remedial as well as removal actions. The information repository is a condensed version of this record and that is available at the Plattsburgh Public Library. Quarterly TRC meetings, one which met on the 16th of last month--they did a site tour and visited I believe seven sites. And the TRC is made up of local community leaders, as well as our base environmental group, and again, the state and federal regulators. News releases--anytime the program reaches a milestone or a note of interest, we have varied channels with the local media so there is very good communication at that end. Public meetings like the one we're having tonight kicks off what is a 30 day comment period in which we invite the public to offer their input into projects that we are undergoing, and these are all included in the final decision. The mailing list--if you signed the sign-up sheet, you'll be added to the IRP mailing list. And again, anytime there is notes of interest or important information, we like to stay in close touch. And at this point, I'm going to turn it over to Mr. Von Bargen and he will give you the breakdown of our program.

VONBARGEN: Thank you. We'll work right from the overhead. First, I'd like to start off with just a simple overview of the Installation Restoration Program, and that's to explain what its purpose is. And that's simply to identify, investigate, evaluate, and preempt any task releases that are necessary to do so. Our process is driven by the CERCLA legislation of 1980, and that was reauthorized in 1986. It was that legislation that created the National Priority List process, of which Plattsburgh Air Force Base was proposed to be on that list in July of 1989, and was final on that list in November of 1989. That puts us as a priority site among locations across the United States to deal with these environmental releases. Along with that then we have a Federal Facilities Agreement, which became effective on 12 September 1991. And that was an agreement that was entered between the Air Force, the USEPA and the State of New York. And that Federal Facilities Agreement then drives the process by which we deal with each and every site on of Plattsburgh Air Force Base. It's broken up very simply into these four stages--identification, investigation, cleanup, and then eventually the closeout of that site. We currently are working--at this public meeting right here--we're in that stage of which we've gone out and investigated these two landfills, documented our findings, and then evaluated the number alternatives, of which we're going to be addressing tonight, and then come up with an Air Force preferred remedy that we're putting up for public

VONBARGEN: comment and consultation and concurrence, with the State of New York and the USEPA. So what we're dealing with tonight are the investigative and feasibility stages of this process. Resources to get this process moving along--the Department of Defense has its own separate account, that is an analgous to like the superfund account. We have here at the base an environmental management flight where we have a staff of approximately 17 people working in the Civil Engineering Squadron under the direct leadership of the Environmental Protection Committee Chairman, Colonel Lias. We have our Environmental Working Group, members of which are here tonight, that meets on a bi-weekly basis and goes over these issues with our sites. We have other government agencies involved, which is obvious with the State of New York and USEPA here. We also have the Army Corp of Engineers and the Department of Energy, and then finally, we have our engineering contractors, from which we go ahead and procure--receive services from under a contractual relationship. Okay. Well, this particular program then is moving in the direction that the two sites that we're working with tonight--well, actually this is a map of 24 sites, and we're working tonight with sites--landfills 22 and 23, which are located on the west side of the base. Now, I'm going to go right into a little bit of background about landfill 23. And what we're going to do is we're going to treat each landfill separately. So, right now we'll address landfill 23. This site was active from 1966 until 1981, and it received residential and municipal waste. And I want to clarify that, that municipal waste is totally from the base facility itself, not from any outside entities. Now, these wastes were deposited into trenches, which were approximately 25 feet and were covered daily. Hazardous wastes were not routinely disposed of in this landfill. However, in our phase I records search, there was a report of a suspected incident of hazardous material being disposed of in the landfill. Ground water associated with this landfill, I do want to mention, is being treated separately. However, the remedy that we select for the landfill unit itself is going to kind of address some of the problems associated with ground water. However, there is a feasibility study process being conducted just for that ground water unit itself. Okay. Well, what kind of activities have occurred there? Again, I go back to 1985, a phase I records search, at which there were interviews that were conducted. A site inspection was performed and documented in July of 1989, when we went out and confirmed basically that there was ground water contamination and some wastes were identified at that time. A remedial investigation was then performed, with the final report being released this past February, and then the feasibility study report, which Rachel--which Ms. Becker will be talking about in a little while. And that feasibility study, which evaluates a number of alternatives, then has a selected remedy that is put forth in a proposed plan, which is what is open for public comment right now. Actually, the feasibility study and the proposed plan are both up for public comment. Okay. Well, very quickly, the type of events that took place to investigate the site involved the

VONBARGEN: surface soils, subsurface soils, ground water, the surface water associated with downslope--a distance away from the site, the actual waste material in the landfill, and some sediments in some seepage areas south of that landfill. The methods that we used to determine what the extent of the landfill was included test trenching, a seismic survey to give us a profile of the geology at the site, a magnetometer survey where we went out and looked for metal anomalies to see if there were any sites of perhaps buried drums, discreet soil sampling, composite sampling of the soils at the surface, a passive soil gas study, and ground water testing. And all of that information is contained in the remedial investigation report. Okay. Well, our findings--basically, we identified 16 different semi-volitile organic compounds in the surface soils, and we also found some trace silver. And one sample has a trace level of PCB, which was about 220 parts per billion. Test trenches dug show that the waste included bagged household trash, construction debris, and scrap metal. And there were no anomalies such as buried drums in large quantities found there. A nearby seep in the water sample included aluminum, arsenic, zinc, and iron. Also, in the sediment sample located near--by that surface water sample were some (inaudible). Again, I do mention that the ground water is being treated separately at this site. And the general conclusions that we can make about this particular landfill were that we found no areas of concentrated elevations that we considered to be hot spots of any signifance were found in that site. Our primary concern at that landfill is surface soil and minimizing infiltration of rainfall through that landfill basin. At this point, Ms. Becker is going to give us an overview and information pertaining to a risk assessment and a feasibility study process and that result.

BECKER: Thanks, Phil. After we obtained the data from our remedial investigation, we proceed on in the process by performing a risk assessment. And risk assessments are basically performed to determine whether remedial action at a site is necessary. These are broken into two groups. There is a human health risk assessment and a habitat risk assessment, which are further broken down into risk groups. There is carcinogenic risk, the non-carcinogenic risk for humans, and the acute risks and chronic risks for the environmental based risk assessment. The EPA has determined that a risk value for carcinogenic risk of 10 to the negative 6 to 10 to the negative 4 is considered acceptable. This is basically a unitless probability of any adverse effects occurring for a population. This level has been determined to be acceptable. In addition, the non-carcinogenic risk is measured as a hazard index, and a hazard index of less than one is considered acceptable. For the ecological risk, it's broken down just a little bit differently. A hazard index of less than .1 indicates that no possible effects will occur. A hazard index between .1 and 10 indicates that possible adverse effects may occur, and a hazard index greater than 10 indicates that probable adverse effects may occur to some individuals.

BECKER: There are handouts on the table that break this process down in a little bit more detail. But, just for simplicity, I'd generalize that the risk rankings, according to the different scenarios that we looked at--part of the risk assessment is developing scenarios in order to assess the risk. And based on landfill 23, we have three risk scenarios. One involves the security police, which use an obstacle course that's located on this landfill. Another is that of a child trespasser. And we also include a hypothetical future resident in our risk evaluation to ensure that we're looking in the long term. Based on these numbers, the security police and child trespasser risks are within acceptable levels. However, the future resident does show an unacceptable risk based on EPA risk levels for carcinogenic risk as well as non-carcinogenic risk for children. For the ecological assessment, we looked at several receptors that we felt were representative of our landfills. These were the white footed mouse, the wood thrush, the garter snake, and red fox, as well as the red tail hawk. And we tried to take a nice representative of carnivores as well as birds and things of that nature. And based on our risk assessment, which again is in more detail in the handout, it indicates that the hazard index is primarily between .1 and 10, which means that possible effects could occur to some individuals. However, wide-spread population effects were not anticipated. After we get done the risk assessment, we determine whether remedial action is necessary. In this case, we have determined that it is. The first thing that we need to do is develop remedial response objectives. With those objectives, we develop a string of alternatives, screening the ones out that we don't feel are appropriate for the site, analyze the several alternatives we pick, and then compare them to chose our preferred alternative. For this site we developed several objectives. Primarily, they're based on minimizing the potential threat and future human and ecological risks of the contaminants found on site, as well as minimize the infiltration of parcipitation through the waste and into the ground water, which is what Phil was trying to impress upon you. The purpose of this feasibility study is not to clean up the ground water. However, it addresses source control aspects of the landfill. Thereby, one of our objectives being preventing more migration through the waste and into the ground water. From our objectives, we came up with several alternatives. One is no action, which includes just monitoring the site. The second one is site grading and a vegetation establishment, which is just basically adding approximately a foot of soil and putting a vegetative cover. Installation of a low permeability barrier cover system, which entails a lot more soil as well as an inpermeable membrane. Excavation and incineration means basically removing all the waste and destroying it through incineration. And stablization/solidification, which is an on-site process of solidifying the waste in place. We screened these alternatives using essentially three different criteria, that is, effectiveness, implimentability, and cost.

BECKER: This is our way of not having to spend a lot of time evaluating alternatives that probably won't be applicable to the site. And based on our evaluation, we determined that the no action vegetative cover and the permeability cover systems were the most appropriate for our site because excavation and incineration and stabilization/solidification are really dependent upon having hot spots or things of that nature. It also entails a lot of extra excavation that may--may bring short term effects to the workers in the area. And we didn't feel that it was any more protective than the other three alternatives, in addition to its being extremely costly. Our three alternatives were evaluated using nine criteria. Basically, the nine criteria is to evaluate whether it's protective of human health and the environment, its permanence and long-term effectiveness, it's implement-ability cost, and compliance with regulations. In addition, the last two criteria are state acceptance and the community acceptance. At this point, we have gotten concurrence from the State and EPA on our preferred alternative, and the community acceptance criteria will be evaluated after all community comments have been submitted. Based on our evaluations, Plattsburgh Air Force Base feels that the preferred remedial alternative is alternative three, the installation of a low permeability variable cover system, which in addition to it being very protective, it also fulfills the Part 360 New York State requirement. It provides overall protection of human health and the environment. It provides long-term effectiveness. And it has the greatest effect on reducing the potential for additional contaminants to migrate through the waste into the ground water at this landfill. And at this point, that concludes the presentation on landfill 23. And Mr. Von Bargen will come back and brief the background on landfill 22.

VONBARGEN: There are--aside from the background, there are a lot of similarities between the two landfills as we progress along here. The age of this landfill is slightly older. It was active from 1959 through 1966. It again also received primarily residential and again, waste from the base entity, in trenched cells. It also reportedly received sludge waste from our base industrial waste water pretreatment facility, which was basically a kind of oil and water separator process. And sludges from that, as they were put out into tanks, were then just apparently disposed of over in that landfill. It also received spent aircraft starter cartriges, which were at one time thought to have been the disposition of munitions waste. However, it really was aircraft starter cartriges. Again, the process is very similar to the landfill 23. This site was looked at in the phase I report in 1985. However, at that time, it was not ranked--it was not considered for further action. In reevaluating the records and understanding the waste water treatment facilities operations and the waste going over there, we reconsidered that site in the site inspection stage. We went out and did some sampling of the waste and thought that we needed to go

VONBARGEN: farther into a remedial investigation report. That was finalized in February of 92, just recently, and that identifies the nature and extent of the contamination we found in that report. It also contains the risk assessment that Miss Becker speaks about. The feasibility study report was just recently completed, which identifies the various alternatives that were considered. And then the proposed plan, which is being put out right now, is for the recommended remedy for that site, and Rachel Becker will speak about that. And again, what did we do out there. It was somewhat similar, except that at this particular site, we didn't have surface water and sediments to go out and sample, but we sampled the surface soil and subsurface ground water, and the waste. We used very similar techniques as we did over at landfill 23. And our findings for this particular landfill were--in this case, there were no volitile or semi-volitile organic compounds in the surface soils. There was DDT, a pesticide, detected at less than 20 parts per million in the surface soils. The wastes themselves were analyzed and detected carbon tetrocholoride and cholroform. This (inaudible) petroleum hydrocarbons and (inaudible) metals. However, the only contaminant that was site related for basically throughout the site was lead. Our general conclusion would be, again, that there are no zones of elevated contamination or what are known as hot spots, and that we also believe that the site condition--the low oxygen site conditions which are typical of many landfills may be increasing the solubility of the naturally occurring iron and maganese, which are in elevated concentrations at that site. I should also say that the ground water--and I don't see it on the bullet there--that the ground water did have levels of--levels of iron and maganese that exceeded New York State ground water standards. And again, that may be because of the anerobic conditions at the site and the iron and maganese that naturally occur going into the solution, or it could also possibly be from metals that are rusting away basically at the landfill site. There also--we don't believe that there is any horizontal--or limited horizontal migration of site contaminants at that particular landfill. Ms. Becker now is going to go into--again, the site risks and the feasibility study leading to a recommended perferred alternative.

BECKER: This is basically the same as the other site. These are considered acceptable risk levels. And again, for ecological risks we have the three different levels of risks. For landfill 22, we had similar scenarios. There was the child trespasser and the future resident. This risk assessment indicates that the hazard index for the child--for a future resident is borderline. The hazard index is 1, which is considered acceptable. It's the same receptors were elevated for landfill 22 as for landfill 23, with similar results. Our risk assessment determined a few individuals may possibly have adverse effects, but there would be no population problems. And again, we go through the same process for landfill 22 and we did for landfill 23. In fact, all of our sites went through this process to go through the

BECKER: feasibility study process. The remedial response objective for this site was basically to minimize the exposure to pesticides in the surface soils at this site. And again, since most landfills of this nature are similar, we had the same remedial alternatives to evaluate. And again, we evaluated these using the three criteria of effectiveness, implementability, and cost. And not surprising, this screened down to the first three alternatives, the same as we did for landfill 23. After evaluating the three alternatives as in the criteria, that is also identifying in the proposed plan, we determined that alternative two for this landfill was appropriate, the vegetative establishment cover system. We determined this because it provides an overall protection of human health and the environment. It provides long-term effectiveness. It's the least costly of the cover system alternatives, and there are actually less adverse ecological impacts with this particular alternative, since alternatives using geomembranes prevent us from planting trees in the area. These--for the feasibility study process, we develop a feasibility study, and that's also--that's located on the table, if anybody wants to flip through it. It's just basically a detailed version of what I've just told you, and a condensed version of the proposed plan, which everyone is welcome to take. And that is actually what people are to comment on. And that concludes the landfill 22 briefing.

PURSUER: At this point, I'm going to turn it over to Mr. Von Bargen to moderate the question and answer period. Again, the public is invited to give inputs that will be used in the final decision, and comments can be made by either using a comment sheet, which are up here in front by the sign-in table, or they call the Public Affairs office directly. (inaudible)

VON BARGEN: Thank you. We are open to questions.

MEYERS: Can you clear up a little bit the difference between plan 2 and plan 3--alternative 2 and 3?

ROACH: For both sites?

MEYERS: Yeah. What is actually the difference between alternatives 2 and 3?

BECKER: The difference is alternative 2 is strictly a vegetation cover. Basically, it's a matter of placing about a foot of soil on top of the existing soil and establishing vegetation over that to enhance the amount of transporation. It essentially protects receptors from the surface soil itself. On the other hand, alternative 3, the low permeability cover system--in addition to having soil being placed on the surface, has a geomembrane, which is a impermeable--which is a low permeability membrane. It prevents approximately 70 percent of the percipitation from

BECKER: infiltrating through the landfill waste. And in the case of landfill 23, we--one of our response objectives to reduce the infiltration. That's why we chose the geomembrane alternative, as opposed to just the vegetative cover for protection of the surface soil.

MEYERS: So, is this like a plastic coating or something like a covering that goes over the--

BECKER: It goes in between the soil layers. In fact, Tom Lawson could probably give you a little bit more detail on the actual components of the cap.

LAWSON: I'm Tom Lawson. Basically, what alternative 3 is, is a full NYS Part 360 cap. Without getting into all of the design details, this is basically what it does is it's a layered approached. First, what you do is you regrade the landfill so that it has a consistent drainage on the cap, and then what you do is you build up layers, okay. And what you're going to do is first is you're going to put down a varied layer. You want to be able to track (inaudible). And then what is put on top of that is an inpermeable layer built up. And then you put a vegetative lawyer on top of that. And the rationale for alternative 3 as opposed to 2, as Rachel mentioned, is because you had concern for landfill 23 being a generator--a waste generator for ground water contamination, so you want to be able to track the source down, and based on that, the perculation rate down from about 13½ inches per year down to about 2½ inches per year based on probability. The necessity for that--alternative 2 for landfill 22 is not the driving force because the big concern of the risk assessment is what we call direct terminal contact, which is like touching your skin or ingestion things in the soil. So that a reason for that (inaudible), which solves the problem for the assessment and also allows (inaudible), which is always a concern when you have landfills that are closed. They weren't closed to state standards because they preclude most state regulations. So, what you want to do is you've got positive readings so you don't want pockets of percipitation laying there. So, that minimum soil grade is 4 percent, and the maximum (inaudible) percent and is generally accepted in New York State.

MEYERS: Did you mention that you won't be able to grow vegetation on level 3, or alternative 3?

VONBARGEN: You would be able to put a grass cover to stabilize the soil.

MEYERS: A grass cover, but you won't be able to plant trees (inaudible)?

VONBARGEN: Right. Because you don't want some--you don't want the root systems of the plant to go down and affect the geotextile membranes that created that lawyer barrier from that infiltration. We should kind of just point out that these two--and Tom did mention--that these two particular landfills were operational

VONBARGEN: and closed at a period of time at which there really wasn't much guidance in terms of how to close these landfills, and that has changed significantly in this day and age today. We're open to your questions.

(inaudible)

MEYERS: I had another question regarding--you mentioned the ground water. There are other things that you're going to be doing with the ground water? Can you explain how you're going to be handling that? That's another program or how is that?

VONBARGEN: Well, we have conducted an investigation at that landfill 23 and it has included addressing the ground water as a medium. And we have found at that location that there is ground water contamination in some low levels that we at this time are trying to address the source and whether it is directly from the landfill or maybe perhaps from an outside source. We're trying to assess that situation and determine what might be directly contributed from the landfill itself, and what comes from some other source nearby. The ground water at that particular site moves in a direction towards the runway, in the south to southeasterly direction. The process will be now to look at the issues of what is there in the ground water, and to evaluate what perhaps may be driving--taking an action, whether it will be some state or EPA regulation, something that's driven by risk, and then developing the same process, this selection of remedies, and evaluating them and determining what would be an appropriate action at that site. So, that will be following in the very near future.

LIAS: I'd like to thank you all for coming. And again, if you haven't signed in, by doing so, you'll be added to the mailing list. I appreciate you all coming out. Thank you very much.

(The meeting was terminated.)

APPENDIX D - RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

The purpose of this Responsiveness Summary is to address comments received during the 4 August 1992 through 3 September 1992 public comment period for LF-023 source control. However, no comments from the public were received.